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Publish statement

Thank you for purchasing this series UPS.
This series UPS is an intelligent, three phase in Three phase out, high frequency online UPS designed by our R&D team who is with years of designing experiences on UPS. With excellent electrical performance, perfect intelligent monitoring and network functions, smart appearance, complying with EMC and safety standards, The UPS meets the world's advanced level.
Read this manual carefully before installation
This manual provides technical support to the operator of the equipment.

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1. Safety

Important safety instructions – Save these instructions

There exists dangerous voltage and high temperature inside the UPS. During the installation, operation and maintenance, please abide the local safety instructions and relative laws, otherwise it will result in personnel injury or equipment damage. Safety instructions in this manual act as a supplementary for the local safety instructions. Our company will not assume the liability that caused by disobeying safety instructions.

1.1 Safety notes

1. Even no connection with utility power, 220/230/240VAC voltage may still exist at UPS outlet!

2. For the sake of human being safety, please well earth the UPS before starting it.

3. Don't open or damage battery, for the liquid spilled from the battery is strongly poisonous and do harmful to body!

4. Please avoid short circuit between anode and cathode of battery, otherwise, it will cause spark or fire!

5. Don't disassemble the UPS cover, or there may be an electric shock!

6. Check if there exists high voltage before touching the battery

7. Working environment and storage way will affect the lifetime and reliability of the UPS. Avoid the UPS from working under following environment for long time

   - ◆ Area where the humidity and temperature is out of the specified range(temperature 0 to 40℃, relative humidity 5%-95%)
   - ◆ Direct sunlight or location nearby heat
   - ◆ Vibration Area with possibility to get the UPS crashed.
   - ◆ Area with erosive gas, flammable gas, excessive dust, etc

8. Keep ventilations in good conditions otherwise the components inside the UPS will be over-heated which may affect the life of the UPS.

1.2 Symbols used in this guide

WARNING!

Risk of electric shock

CAUTION!

Read this information to avoid equipment damage

2. Main Features

2.1 Summarization

This series UPS is a kind of three-in-three-out high frequency online UPS, it provides seven specifications: The 10KVA/15KVA /20KVA /30KVA/40KVA/60KVA and 80KVA. The products are modularized and adopt the N+X redundancy. It can flexibly increase the number of the UPS modules according to the load capacity which is convenient for flexible allocation and gradually investment.

The UPS can solve most of the power supply problems, such as blackout, over-voltage, under-voltage, voltage sudden drop, oscillating of decreasing extent, high voltage pulse, voltage fluctuation, surge, inrush current, harmonic distortion (THD), noise interference, frequency fluctuation, etc..

This UPS can be applied to different applications from computer device, automatic equipment, communication system to industry equipment.

2.2 Functions and Features

◆3Phase In/3Phase Out UPS

It is 3Phase In/3Phase Out high-density UPS system, of which input current is kept in balance. No unbalance problem might occur.

◆Digital Control

This series UPS is controlled by Digital Signal Processor(DSP); ehance, it increases reliability, performance, self-proteciton, self-diagnostics and so on.

◆Modular Design

This series UPS adopts modular design concept. The capacities of modules available are 10KVA, 15KVA ,20KVAand 30KVA.

◆Battery Configurable from 32 blocks to 40 blocks

The battery voltage of this series UPS can be configured at 32 blocks, 34 blocks, 36 blocks, 38 blocks or 40 blocks according to your convenience.

◆Charging Current is configurable

Via setting tool, the user may set the capacity of the batteries as well as reasonable charging current as well as maximum charging current. Constant voltage mode, constant current mode or floating mode can be switched automatically and smoothly.

◆Intelligent Charging Method

The series UPS adopts advanced three-stage charging method—

1st stage: high current constant current charging

to guarantee to charge back to 90%;

2nd-stage: Constant Voltage

In order to vitalize battery and make sure batteries are fully charged

3rd stage: floating mode.

With this 3-stage charging method, it extends the life of the batteries and guarantees fast charging.

◆LCD Display

With LCD plus LED displays, the user may easily get UPS status and its operational parameters, such as input/output voltage, frequency & load%, battery % and ambient temperature, etc..

◆Intelligent Monitoring Function

Via optional SNMP Card, you may remotely control and monitor the UPS.

◆EPO Function

The series UPS may be completely shut off when the EPO is pressed. REPO function(Remote EPO) is also available in this series UPS.

3. Installation

3.1 Unpack checking

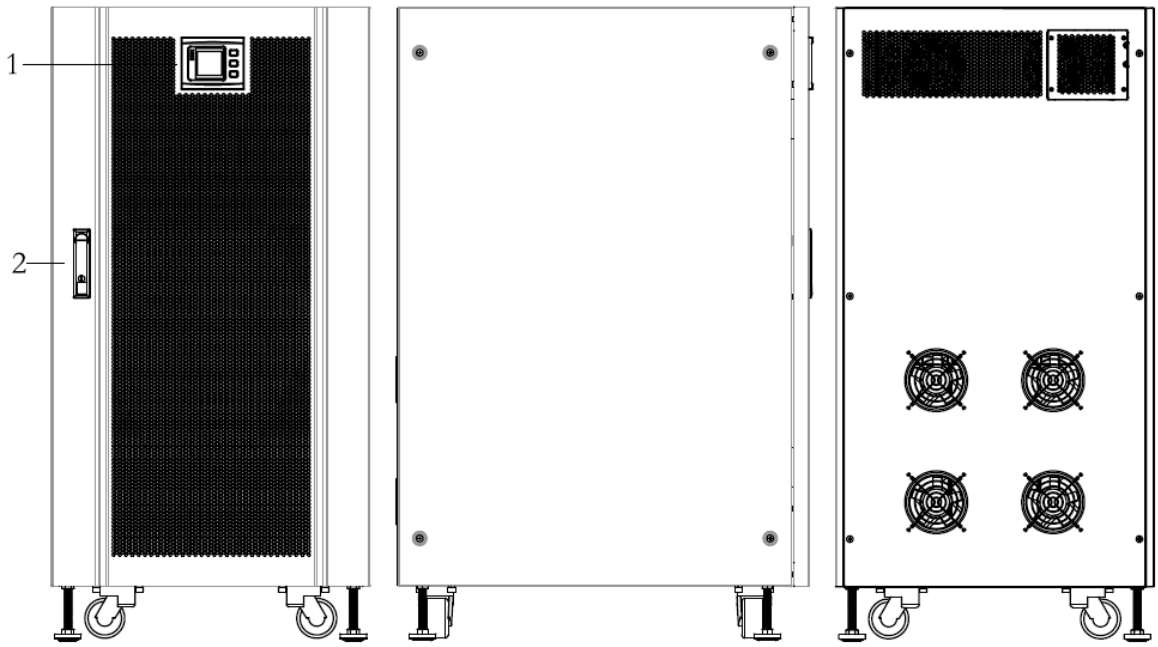
1.Don’t lean the UPS when moving it out from the packaging

2.Check the appearance to see if the UPS is damaged or not during the transportation, do not switch on the UPS if any damage found. Please contact the dealer right away.

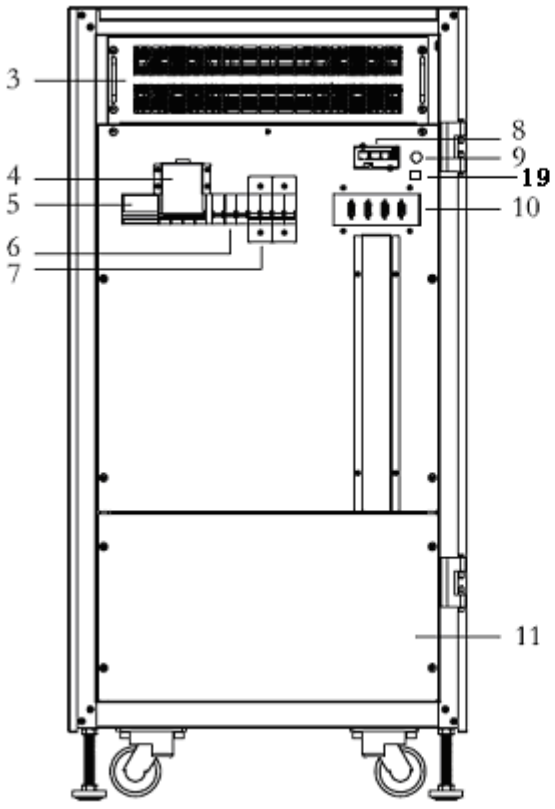
3.Check the accessories according to the packing list and contact the dealer in case of missing parts.

3.2 Cabinet Outlook

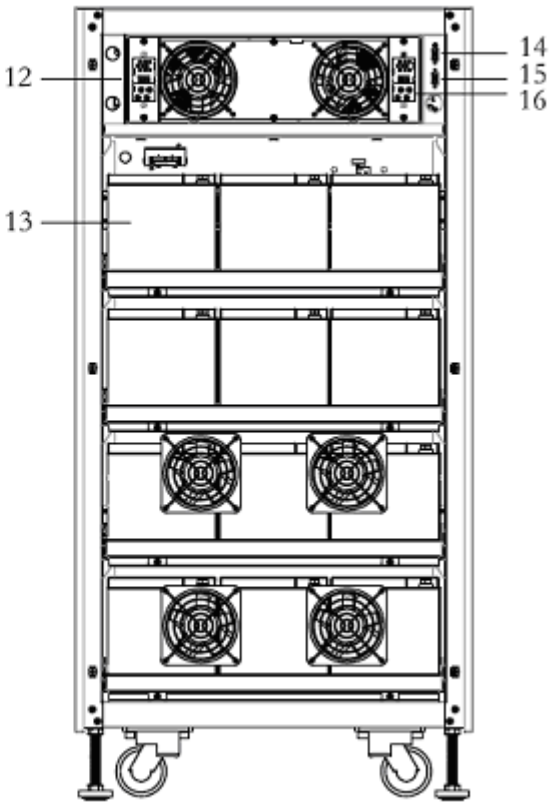
1. 10/15/20/30KVA



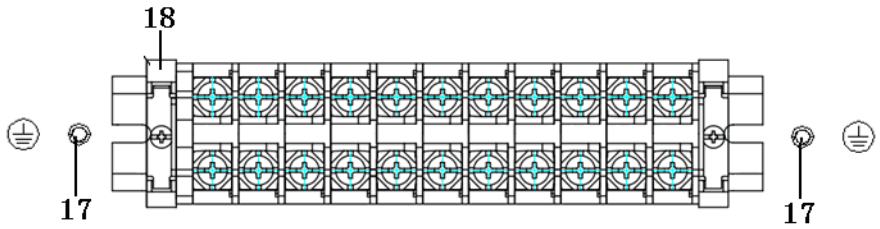
Front View **Side View** **Rear View**



Front View (internal)



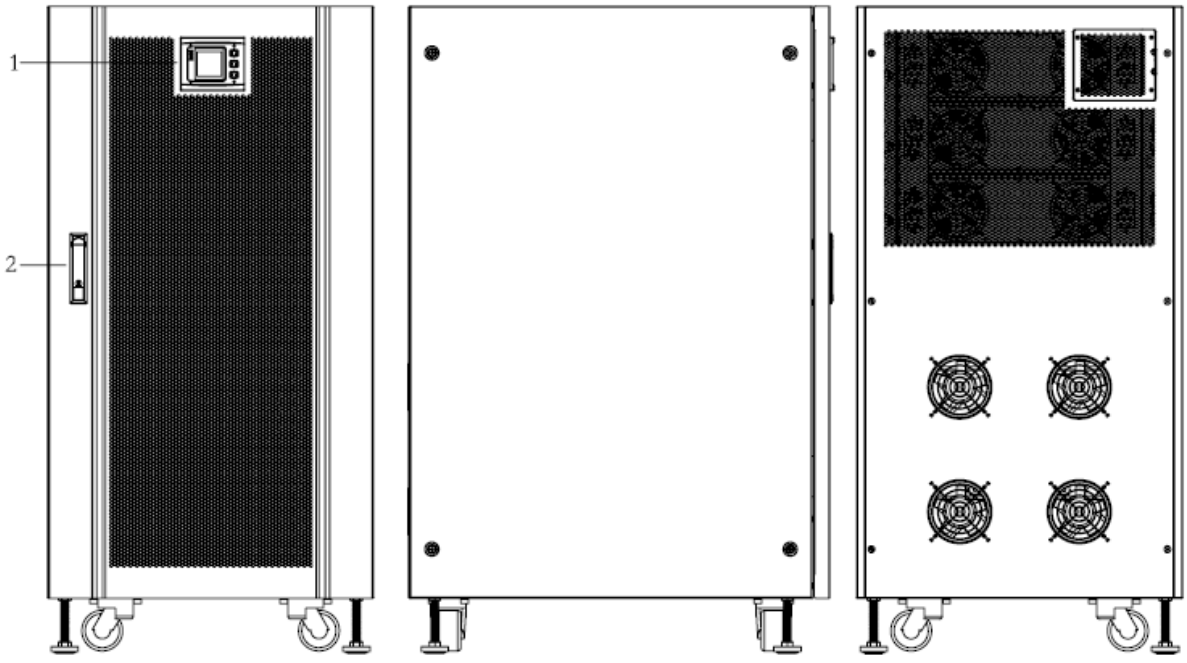
Rear View（internal）



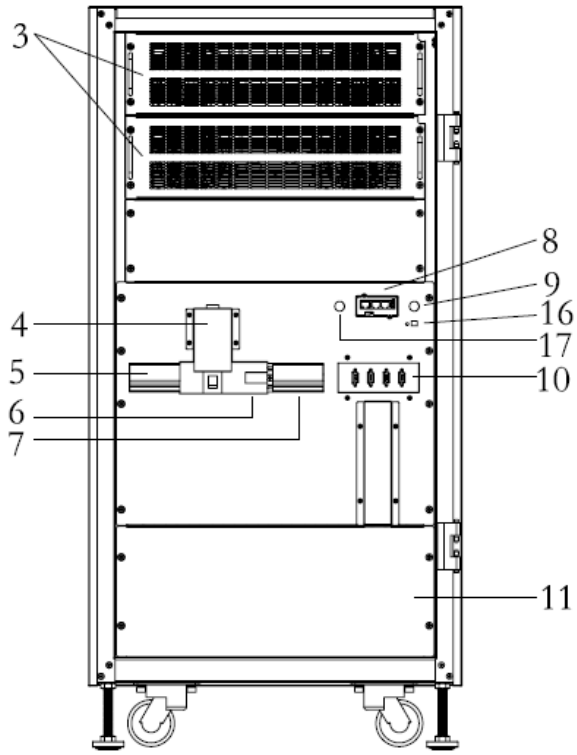
Terminal Block（terminal block without cover）

(1) LCD panel	(2) Front lock	(3) UPS Module	(4) Maintenance switch & its cover
(5) I/P Switch	(6) O/P Switch	(7) Battery Switch	(8) Intelligent Solt
(9) EPO switch	(10) Communication port （ SNMP/R232/R485）	(11) Terminal Block cover	(12) Input connector slot of UPS Module
(13) Battery	(14) Parallel port 1	(15) Parallel port 2	(16) Output connector slot of UPS Module
(17) GND	(18) Terminal block for Input, output & battery		（19）REPO port

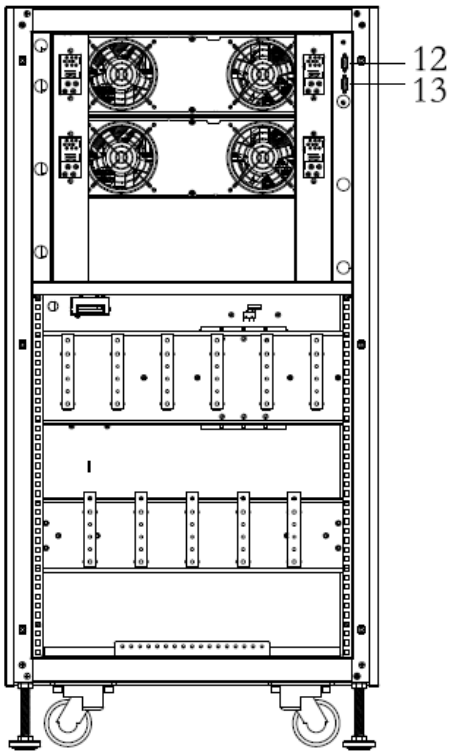
2. 40/60/80KVA



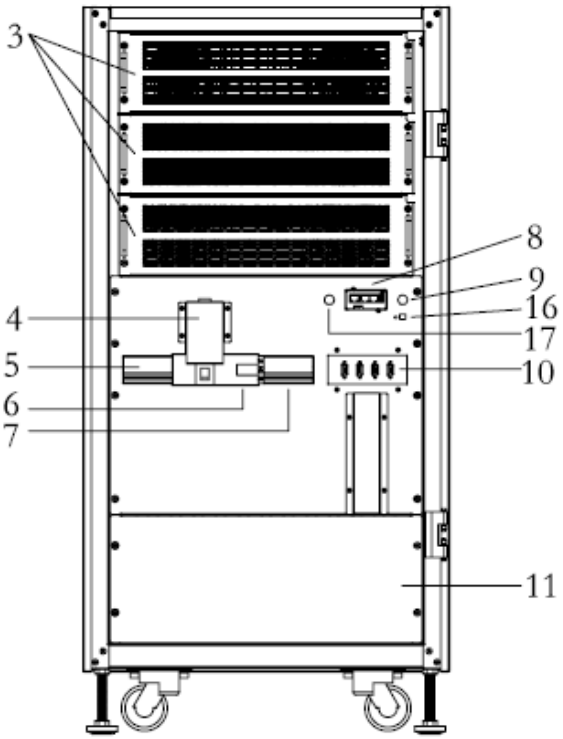
Front View **Side View** **Rear View**



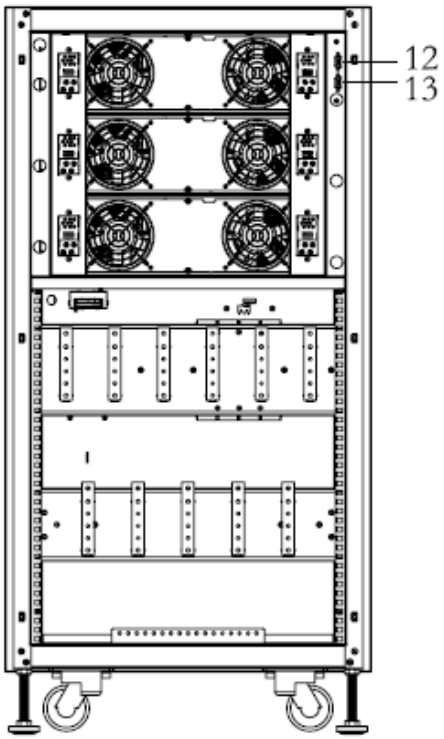
40/60KVA front view（internal）



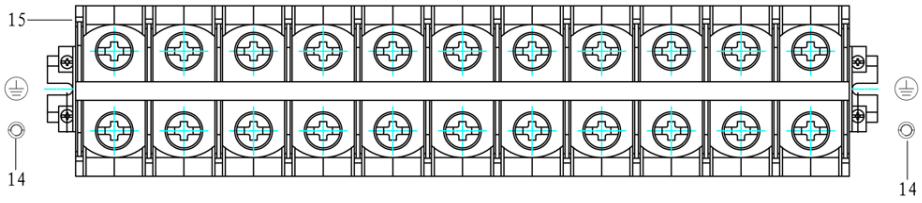
40/60KVA rear view（internal）



80KVA front view（internal）

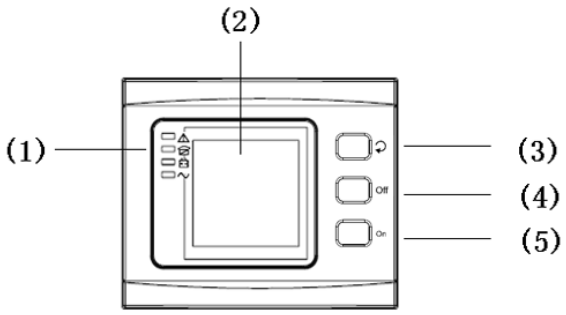


80KVA rear view（internal）



(1) LCD panel	(2) Front lock	(3) UPS Module	(4) Maintenance switch & its cover
(5) I/P Switch	(6) Maintenance switch	(7) O/P Switch	(8) Intelligent Solt
(9) EPO switch	(10) Communication port （SNMP/R232/R485）	(11) Terminal Block cover	(12) Parallel port 1
(13) Parallel port 2	(14) GND	(15) Terminal block for Input, output & battery	(16) REPO port
(17) Battery Cold start switch			

3.3 LCD control panel



LCD control panel introduction

（1）LED（from top to bottom: “alarm”, “bypass”, “battery”, “inverter”） （2）LCD display（3）scroll button （4）Off button （5）On button(battery cold start switch for 10-30KVA)

3.4 Installation notes

Note: Consider for the convenience of operation and maintenance, the space in front and back of the cabinet should be left at least 100cm and 80cm respectively when installing the cabinet .

◆Please place the UPS in a clean, stable environment, avoid the vibration, dust, humidity, flammable gas and liquid, corrosive. To avoid from high room temperature, a system of room extractor fans is recommended to be installed. Optional air filters are available if the UPS operates in a dusty environment.

◆The environment temperature around UPS should keep in a range of 0℃～40℃. If the environment temperature exceeds 40℃, the rated load capacity should be reduced by 12％ per 5℃. The max temperature can't be higher than 50℃.

◆If the UPS is dismantled under low temperature, it might be in a condensing condition.The UPS can't be installed unless the internal and external of the equipment is fully dry. Otherwise, there will be in danger of electric shock.

◆Batteries should be mounted in an environment where the temperature is within the required specs. Temperature is a major factor in determining battery life and capacity. In a normal installation, the battery temperature is maintained between 15°C and 25°C. Keep batteries away from heat sources or main air ventilation area, etc.

WARNING!
Typical battery performance data are quoted for an operating temperature between 20°C and 25°C. Operating it above this range will reduce the battery life while

operation below this range will reduce the battery capacity.

◆Should the equipment not be installed immediately it must be stored in a room so as to protect it against excessive humidity and or heat sources。

CAUTION!
An unused battery must be recharged every 6months Temporarily connecting the UPS to a suitable AC supply mains and activating it for the time required for recharging the batteries.

◆The highest altitude that UPS may work normally with full load is 1500 meters. The load capacity should be reduced when this UPS is installed in place whose altitude is higher than 1500 meters, shown as the following table:

（Load coefficient equals max load in high altitude place divided by nominal power of the UPS）

Altitude（m）	1500	2000	2500	3000	3500	4000	4500	5000
Load coefficient	100%	95%	90%	85%	80%	75%	70%	65%

◆The UPS cooling is depending on fan, so it should be kept in good air ventilation area. There are many ventilation holes on the front and rear, so they should not be blocked by any exotic obstacles.

3.5 External Protective Devices

For safety reasons, it is necessary to install, external circuit breaker at the input A.C. supply and the battery. This chapter provides guidelines for qualified installers that must have the knowledge of local wiring practices for the equipment to be installed.

◆External Battery

The UPS and its associated batteries are protected against the effect of over-current through a DC compatible thermo-magnetic circuit-breaker (or a set of fuses) located close to the battery.

◆UPS Output

Any external distribution board used for load distribution shall be fitted with protective devices that may avoid the risk of UPS overloaded.

◆Over-current

Protection device shall be installed at the distribution panel of the incoming main supply. It may identify the power cables current capacity as well as the overload capacity of the system .

CAUTION !

Select a thermo magnetic circuit-breaker with an IEC 60947-2 trip curve C (normal) for 125% of the current as listed below.

3.6 Power Cables

◆The cable design shall comply with the voltages and currents provided in this section, Kindly follow local wiring practices and take into consideration the environmental conditions (temperature and physical support media) .

WARNING！

UPON STARTING, PLEASE ENSURE THAT YOU ARE AWARE OF THE LOCATION AND OPERATION OF THE EXTERNAL ISOLATORS WHICH ARE CONNECTED TO THE UPS INPUT/BYPASS SUPPLY OF THE MAINS DISTRIBUTION PANEL.CHECK TO SEE IF THESE SUPPLIES ARE ELECTRICALLY ISOLATED, AND POST ANY NECESSARY WARNING SIGNS TO PREVENT ANY INADVERTENT OPERATION

◆For future expansion purpose, it is economical to install power cable according to the full rating capacity initially. The diameter of cable is shown bellow：

UPS cabinet	Cable Dimension			
	AC Input (mm^2)	AC Output (mm^2)	DC Input (mm^2)	Grounding (mm^2)
10KVA	4	4	6	4
15KVA	6	6	8	6
20KVA	8	8	10	8
30KVA	12	12	16	12
40KVA	16	16	20	16
60KVA	24	24	32	24
80KVA	32	32	40	32

CAUTION!

Protective earth cable: Connect each cabinet to the main ground system. For Grounding connection, follow the shortest route possible。

WARNING!

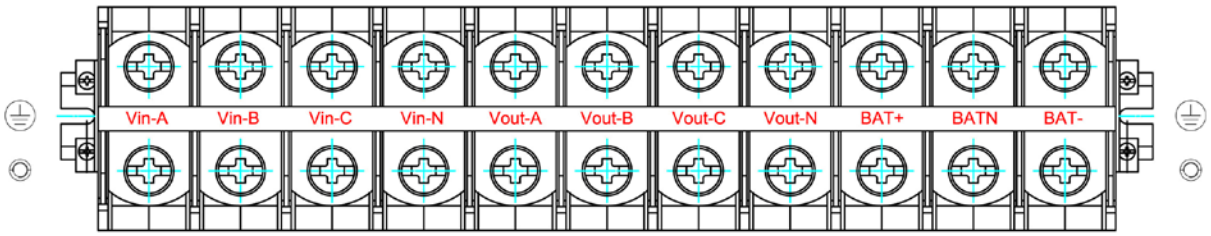
FAILURE TO FOLLOW ADEQUATE EARTHING PROCEDURES MAY RESULT IN ELECTROMAGNETIC INTERFERENCE OR IN HAZARDS INVOLVING ELECTRIC SHOCK AND FIRE

3.7 Power cable connect

Once the equipment has been finally positioned and secured, connect the power cables as described in the following procedure.

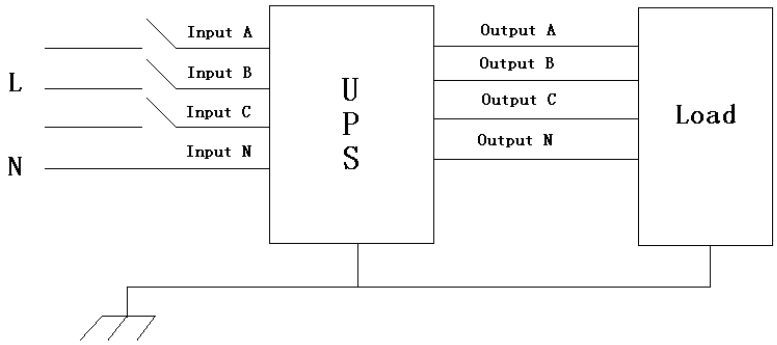
Verify the UPS is totally isolated from its external power source and also all power isolators of the UPS are open. Check to see if they are electrically isolated, and post any necessary warning signs to prevent their inadvertent operation .

Open the UPS rear panel, remove the cover of terminals for wiring easily.



Terminal sequence from left to right: Input phase A(L1), input phase B(L2), input phase C(L3), input Neutral line, output phase A(L1), output phase B(L2), output phase C(L3), output Neutral line, battery positive, battery Neutral, battery negative. The termnial block's left & right ends each has a connector for Ground.

Choose appropriate power cable.（Refer to the table above）and pay attention to the diameter of the connection terminal of the cable that should be greater than or equal to that of the connection poles;



WARNING!

If the load equipment is not ready to accept power on the arrival of the commissioning engineer then ensure that the system output cables are safely isolated at their ends

Connect the safety earth and any necessary bonding earth cables to the copper earth screw located on the floor of the equipment below the power connections. All cabinets in the UPS must be grounded properly.

CAUTION!

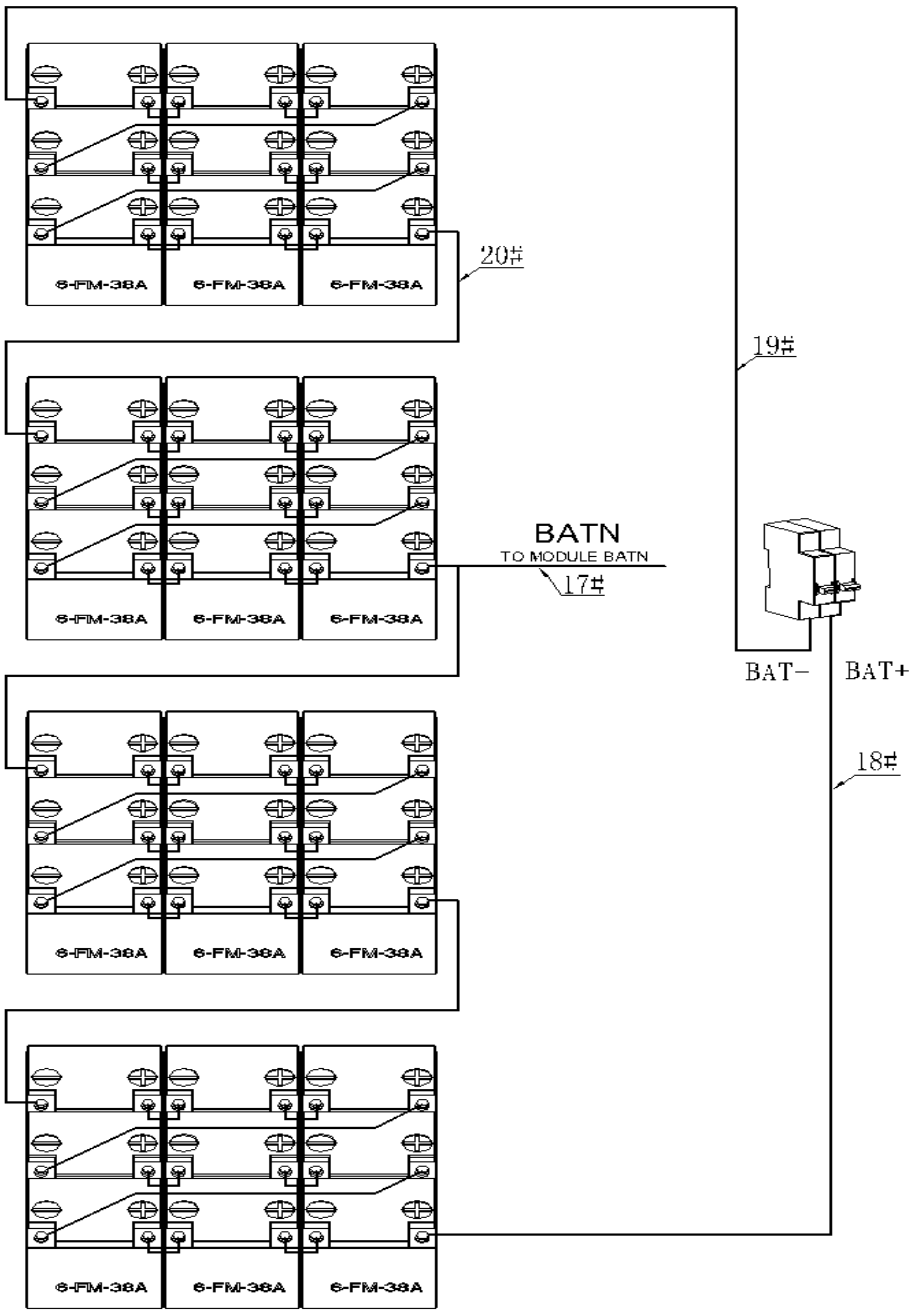
The earthing and neutral bonding arrangement must be in accordance with local and national codes of practice.

3.8 Battery connection

The UPS adopts positive and negative double battery framework, total 32(optional 34/36/38/40) in series. A neutral cable is retrieved from the joint between the cathode of the 16th (17th/18 th/19th/20 th) and the anode of the 17th (18th/19 th/20th/21 th) of the batteries. Then the neutral cable, the battery Positive and the battery negative are connected with the UPS respectively. The battery sets between the Battery anode and the neutral are called positive batteries and that between neutral and cathode

are called negative ones. The user can choose the capacity and the numbers of the batteries according to their desire.

Internal battery connection in standard unit:

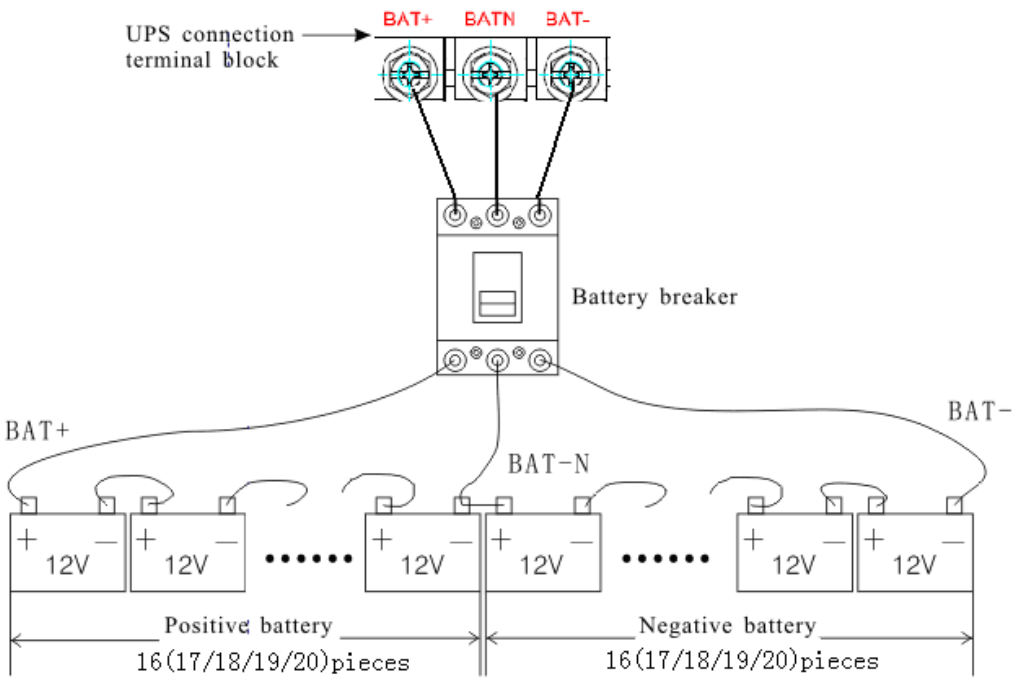


Note：

The BAT+ of the UPS connect poles is connected to the anode of the positive battery, the BAT-N is connected to the cathode of the positive battery and the anode of the negative battery, the BAT- is connected to the cathode of the negative battery。

Factory setting of the standard unit is battery quantity---36pcs, battery capacity---12V38AH.

External battery connections for long-run units.



Note：

The BAT+ of the UPS connect poles is connected to the anode of the positive battery, the BAT-N is connected to the cathode of the positive battery and the anode of the negative battery, the BAT- is connected to the cathode of the negative battery。Factory setting of the long-run unit is battery quantity---32pcs, battery capacity---12V65AH. When connecting 32/34/38/40 batteries, please re-set desired battery quantity and its capacity after UPS starts at AC mode. Charger current could be adjusted automatically according to battery capacity selected. All related settings can be done through LCD panel or monitoring software

CAUTION!

Ensure correct polarity battery string series connection. i.e. inter-tier and inter block connections are from (+) to (-)terminals.

Don't mix batteries with different capacity or different brands, or even mix up new and old batteries, either.

WARNING!

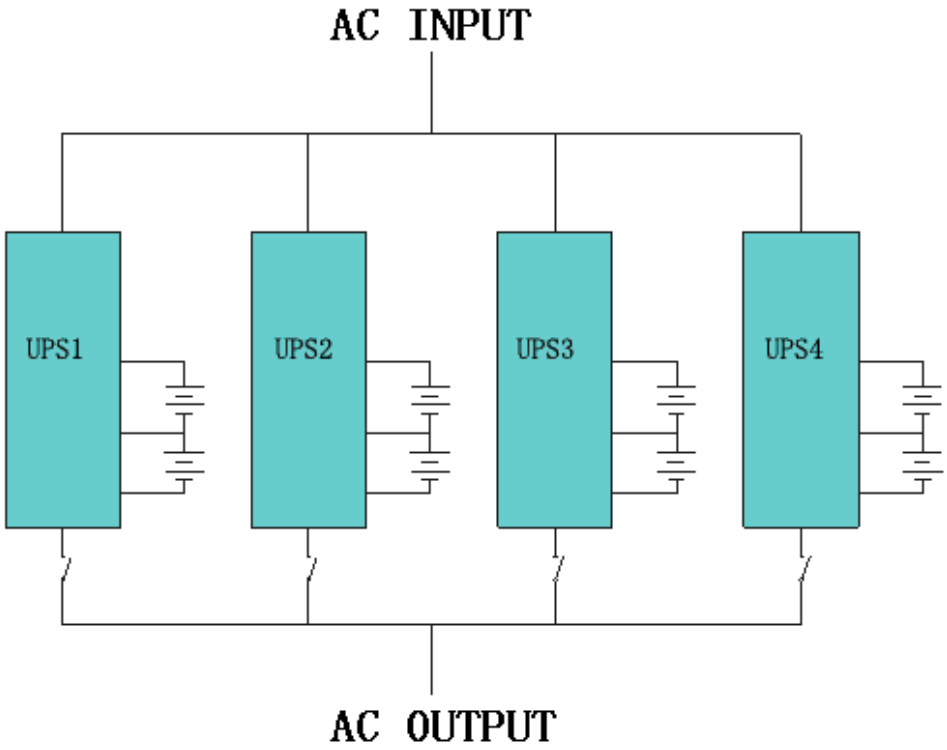
Ensure correct polarity of string end connections to the Battery Circuit Breaker and from the Battery Circuit Breaker to the UPS terminals i.e. (+) to (+) / (-) to (-) but disconnect one or more battery cell links in each tier. Do not reconnect these links and do not close the battery circuit breaker unless authorized by the commissioning engineer.

3.9 UPS Multi—Module Installation

The basic installation procedure of a parallel system comprising of two or more UPS modules is the same as that of single module system. The following sections introduce the installation procedures specified to the parallel system.

3.9.1 Cabinet installation

Connect all the UPSes needed to be put into parallel system as below picture.



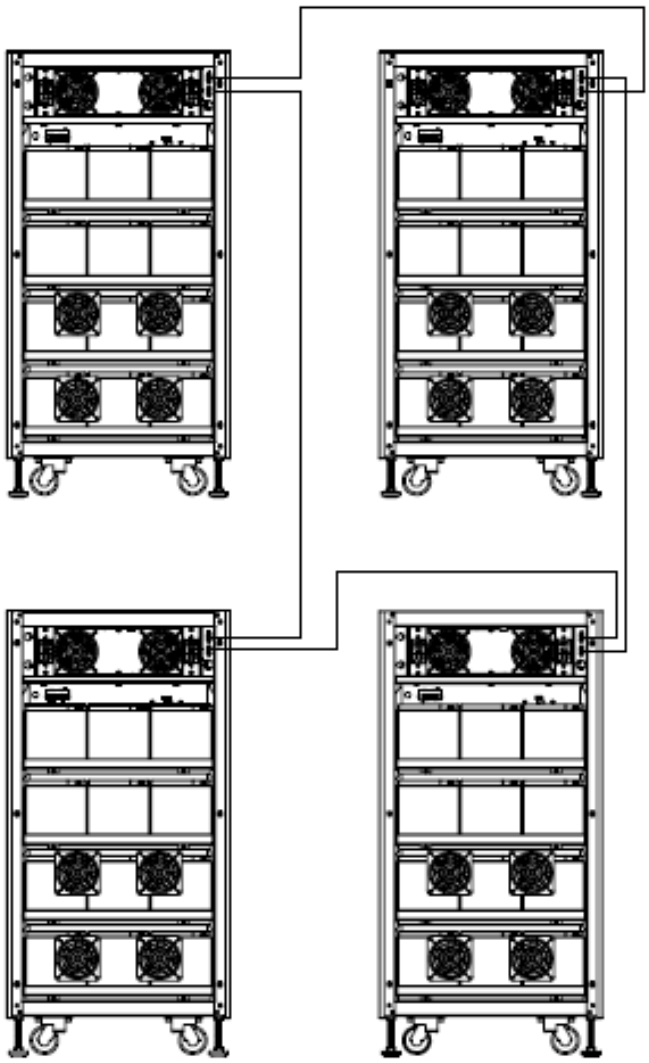
Make sure each UPS input breaker is in “off” position and there is no any output from each UPS connected. Battery groups can be connected separately or in parallel, which means the system itself provides both separate battery and comman battery.

WARNING!

Make sure the N、A（L1）、B（L2）、C（L3）lines are correct, and grouding is well connected.

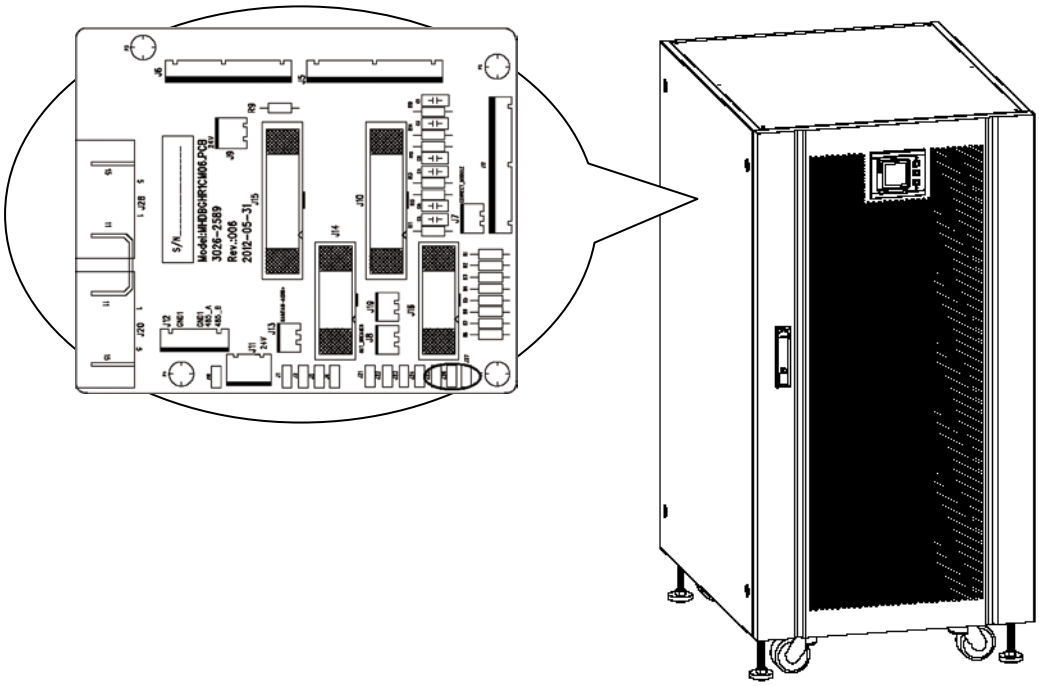
3.9.2 Parallel cable installation

Shielded and double insulated control cables available must be interconnected in a ring configuration between UPS modules as shown below. The parallel control board is mounted on each UPS module. The ring configuration ensures high reliability of the control.



CAUTION !

When parallel 3untis or 4units 40/60/80KVA, it needs to knock down the left panel of the cabinet, and make a modification of jumper caps to the parallel board (MHDBGHR1CM06) as shown in below picture.



CAUTION！

40/60/80KVA when have 3units parallel, pls remove the jumper caps at J26, J27 on all unit's parallel board (MHDBGHR1CM06).

40/60/80KVA when have 4units parallel, pls remove the jumper caps at J25, J26, J27 on all unit's parallel board (MHDBGHR1CM06).

40/60/80KVA when have 2units paralle, do not need any modification on parallel board.

10/15/20/30KVA when have 2~4units parallel, do not need any modification on parallel board.

3.9.3 Requirement for the parallel system

A group of paralleled modules behave as one large UPS system but with the advantage of presenting higher reliability. In order to assure that all modules are equally utilized and comply with relevant wiring rules, please follow the requirements below:

1) All UPS modules must be of the same rating and be connected to the same bypass source.

2) The outputs of all the UPS modules must be connected to a common output bus.

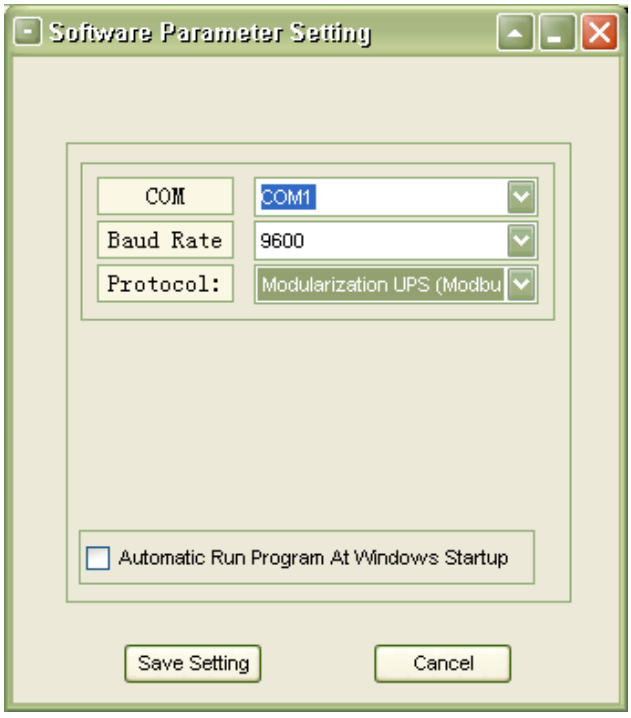
3) The length and specification of power cables including the bypass input cables and the UPS output cables should be the same. This facilitates load sharing when operating in bypass mode.

3.10 Computer access

◆One end of a RS232 communication cable connect to the computer, the other end connect to the RS232 port on the UPS.

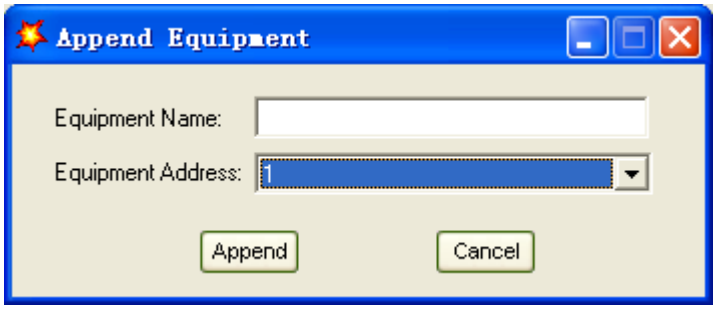
◆Open the software Muser4000, click “system” button.

◆A window of “Software Parameter Setting” comes out as below, COM choose according to the UPS , baud rate choose 9600, protocol choose “modularization UPS (Modbus)”, then save this setting.



◆On the main page of Muser4000, click the button of “Append”, then goes to a window of “Append equipment”.

◆Put the UPS name into “Equipment Name”, and UPS’ ID address into “Equipment address”.



◆Click the button “Append”, then the connection between UPS & computer is accomplished.

CAUTION!

When the UPS worked on inverter. If you want to use PC to set the output voltage and frequency. Must shut down the inverter first

4. Operation

4.1 Operation Modes

The UPS is a double-conversion on-line UPS that may operate in the following alternative modes：

◆Normal mode

The rectifier/charger derives power from the AC Mains and supplies DC power to the inverter while floating and boosting charge the battery simultaneously. Then, the inverter converts the DC power to AC and supplies to the load.

◆Battery mode (Stored Energy Mode)

If the AC mains input power fails, the inverter, which obtains power from the battery, supplies the critical AC load. There is no power interruption to the critical load. The UPS will automatically return to Normal Mode when AC recovers.

◆Bypass mode

If the inverter is out of order, or if overload occurs, the static transfer switch will be activated to transfer the load from the inverter supply to bypass supply without interruption to the critical load. In the event that the inverter output is not synchronized with the bypass AC source, the static switch will perform a transfer of the load from the inverter to the bypass with power interruption to the critical AC load. This is to avoid paralleling of unsynchronized AC sources. This interruption is programmable but typically set to be less than an electrical cycle e.g. less than 15ms (50Hz) or less than 13.33ms (60Hz).

◆ECO Mode

When the UPS is at AC Mode and the requirement to the load is not critical, the UPS can be set at ECO mode in order to increase the efficiency of the power supplied. At ECO mode, the UPS works at Line-interactive mode, so the UPS will transfer to bypass supply. When the AC is out of set window, the UPS will transfer from bypass to Inverter and supplies power from the battery, then the LCD shows all related information on the screen.

◆Parallel redundancy mode (system expansion)

To achieve a higher capacity and / or increase reliability, the outputs of up to four UPS modules can be programmed to operate in parallel and the built-in parallel controller in each UPS ensures automatic load sharing.

◆Maintenance mode (Manual Bypass)

A manual bypass switch is available to ensure continuity of supply to the critical load when the UPS is out of order or in repair, and this manual bypass switch bears for equivalent rated load.

4.2 Turn on/off UPS

4.2.1 Restart procedure

CAUTION!

MAKE SURE GROUNDING IS PROPERLY DONE!

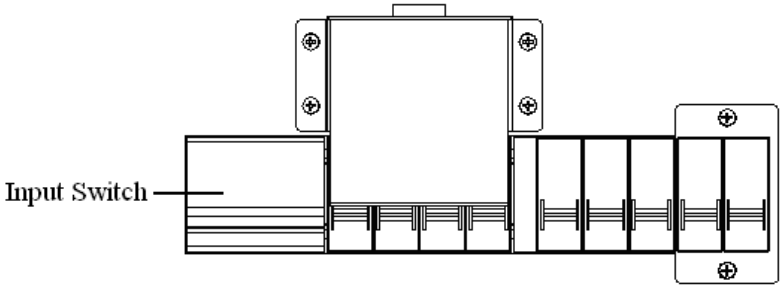
◆ Set the Battery Breaker to the "ON" position according to the user's manual.

◆ Open the front and rear doors of the UPS to access to the main power switches. During this procedure the output terminals will become alive.

CAUTION!

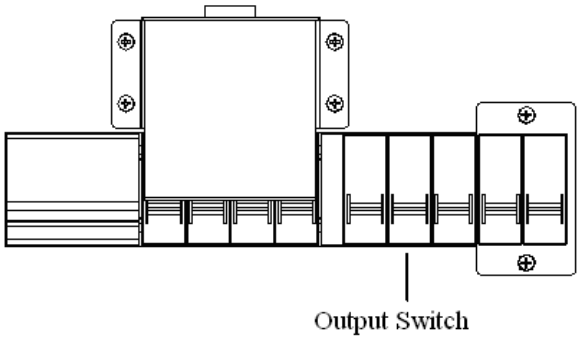
Check to see if the load is safely connected with the output of the UPS. If the load is not ready to receive power from the UPS, make sure that it is safely isolated from the UPS output terminals

◆ UPS Input Switch(below the UPS module at the front door)



If the Rectifier input is within voltage range, the rectifier will start up in 30 seconds then the inverter will start up after then.

◆ UPS Output Switch(below the UPS module at the front door)



If the recetifier fails at startup, the bypass LED will light up. When the inverter starts up, the UPS will transfer from bypass mode to inverter mode, then the bypass LED extinguishes and the inverter LED lights up.

No matter whether the UPS can work normally or not, all the status will be shown on the LCD display.

4.2.2 Test procedure

CAUTION!

The UPS is operating normally.
It may take 60 seconds to boost up the system and perform self-test completely.

◆ Switch off the MAINS to simulate utility failure, the rectifier will turn off and the battery should feed the inverter without interruption. At this time, the LEDs of battery should be turned on.

◆ Switch on the MAINS to simulate utility recovery, the rectifier will restart automatically after 20 seconds and the inverter will supply to the load. It is suggested to use Dummy loads for testing. The UPS can be loaded up to its maximum capacity during load test。

4.2.3 MAINTENANCE BYPASS

To supply the load via Mains, you may simply active the internal mechanical bypass switch.

CAUTION!

The load is not protected by the UPS when the internal mechanical bypass system is active and the power is not conditioned.

Switch to mechanical bypass

CAUTION!

If the UPS is running normally and can be controlled through the display, carry out steps 1 to 5; otherwise, jump to Step 4.

◆ Open the cover of maintenance switch, the UPS turns to bypass mode automatically.

◆ Turn on MAINTANCE breaker;

◆ Open BATTERY breaker;

◆ Switch OFF the MAINS breaker,

◆ Switch OFF OUTPUT breaker;

At this time the bypass source will supply to the load through the MAINTENANCE breaker.

Switch to normal operation (from mechanical bypass)

CAUTION!

Never attempt to switch the UPS back to normal operation until you have verified that there are no internal UPS faults

◆ Open the front door of the UPS to be easily access to the main power switch.

◆ Switch ON the output breaker of the module.

◆ Switch ON the input breaker.

The UPS powers from the static bypass instead of the maintenance bypass, then the bypass LED will light up.

◆ Switch OFF the maintenance bypass breaker, then the output is supplied by the bypass of the modules.

◆ Put on the maintenance switch cover.

The rectifier will operate normally after 30 seconds. If the inverter works normally, the system will be transferred from bypass mode to normal mode.

4.2.4 Cold start procedure

CAUTION!

When the input mains supply is abnormal and battery is normal, UPS will shutdown when using this program

◆ Close battery switch.

The battery supplies power for the auxiliary power panel.

◆ Close output switch

◆ Press the cold start button of power module

When the battery is normal, the rectifier begins to work. After about 30 seconds till the inverter starts, the battery lights.

CAUTION!

Please press the close start button after 30 seconds until closing the battery switch.

4.2.5 Shut down procedure

CAUTION!

This procedure should be followed to completely shut down the UPS and the LOAD. After all power switches, isolators and circuit breakers are opened, there will be no output.

◆ Open the BATTERY breaker；

◆ Open the UPS door to easily access to the main power switch；

◆ Switch OFF the input breaker.

◆ Open the OUTPUT power switch. The UPS shuts down；

◆ To completely isolate the UPS from AC Mains, all input switches of Utility shall be completely off, which includes the ones for rectifier and bypass.

◆ The primary input distribution panel, which is often located far away from the UPS area, so a label should be posted to advise service personnel that the UPS circuit is under maintenance。

WARNING!

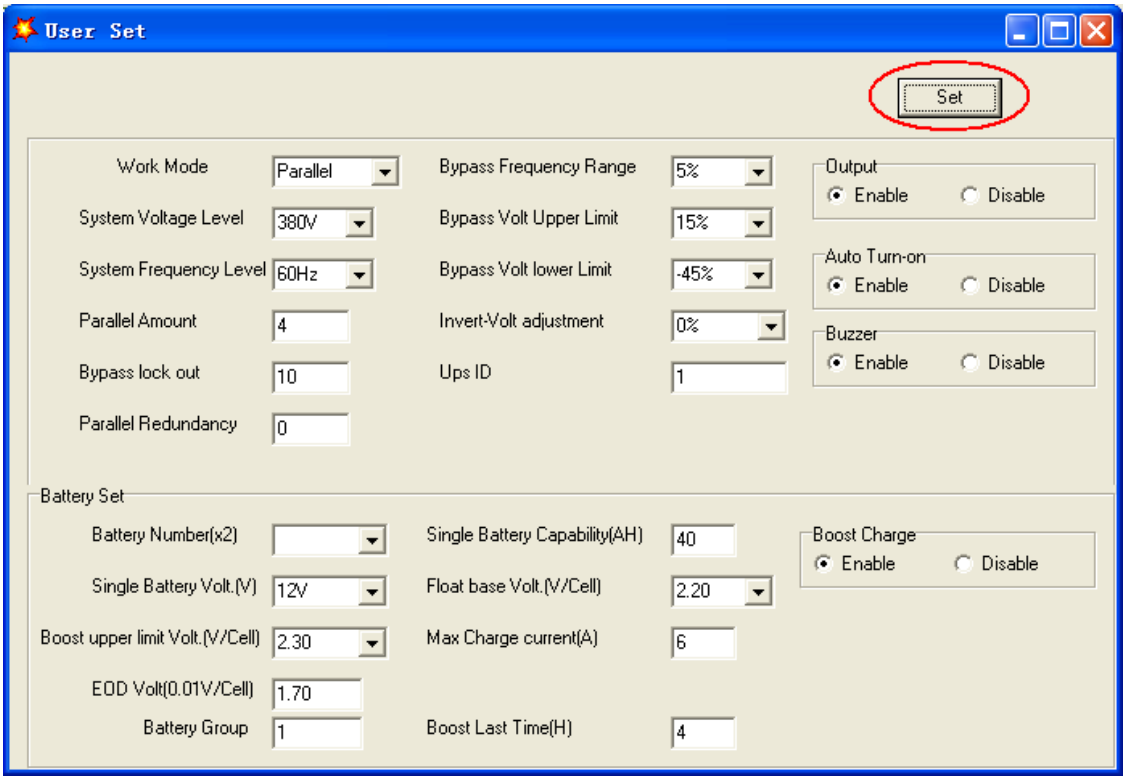
Wait for about 5 minutes for the internal D.C. bus bar capacitors to be completely discharged.

4.2.6 Parallel setting

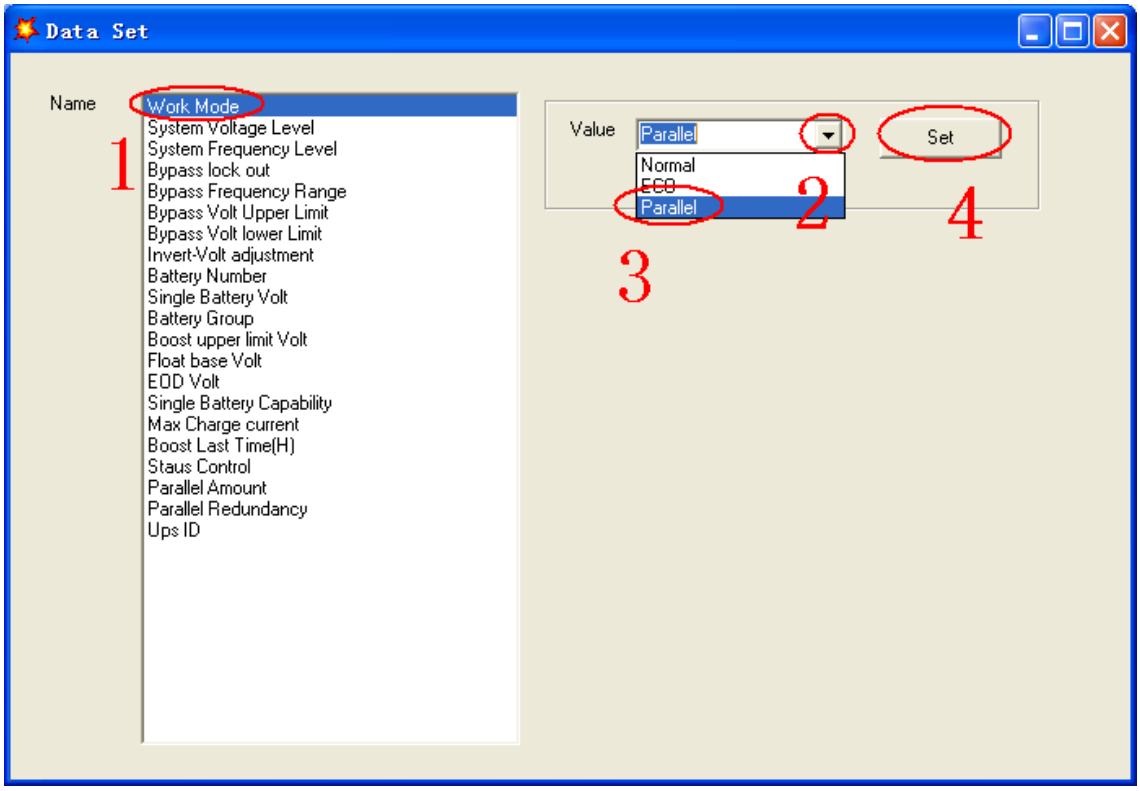
◆Connect the UPS with computer. Power on the UPS.

◆Open Muser4000 software, after connecting with the UPS successfully, click "System"->"User Set"

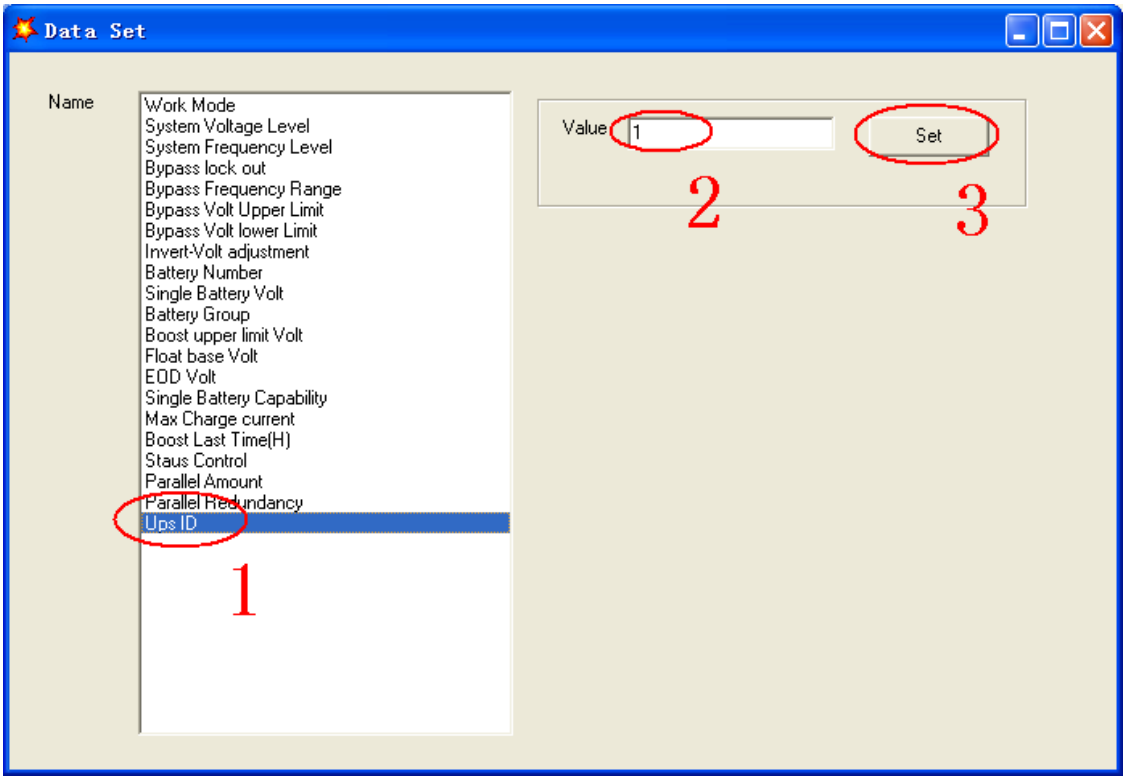
◆Click "Set" at "User Set" window;



◆At the window of "Data Set", click "Work Mode",, choose "Parallel" for the value, then click "Set" as shown in below picture. If the UPS sounds a "beep", that means the setting is correct.



◆At the window of "Data Set", click "Ups ID", write a value for the parallel UPS ID at the right side, such as "1", then click "Set" as shown in below picture. If the UPS sounds a "beep", that means the setting is correct.



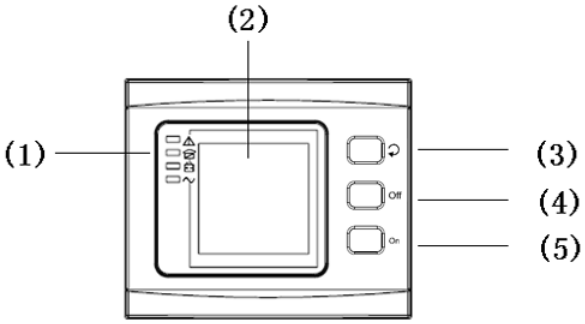
After changing the parallel system ID, the connection between Muser4000 and equipment might be interrupted. If it occurs, please re-connect in accordance with the instruction described before.

CAUTION!

Parallel cable cannot be connected when setting the parallel parameters.

◆After setting the UPSes needed to be paralleled, power off all the UPSes. Connect all the UPSes according to “parallel cable installation”, and then power on the UPSes.

4.3 The LCD Display



Overview of the operating panel of the UPS

(1)LED indicator (2)LCD display (3)Scroll button:enter to next item (4)Off button (5)On button

Introduction

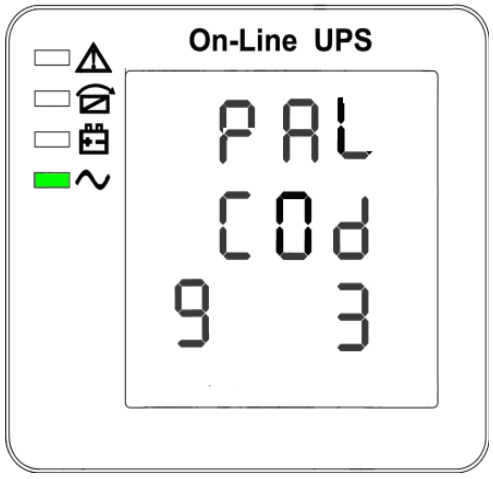
CAUTION!

The display provides more functions than those described in this manual.

There are 17 interfaces available in the LCD display:

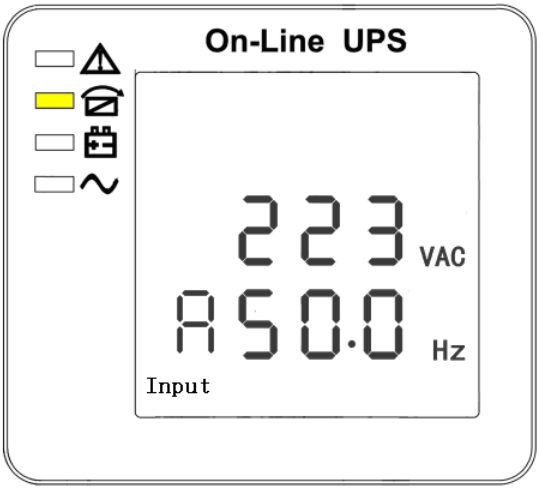
Item	Interface Description	Content Displayed
01	CODE	Operational status and mode
02	Input A(Input L1)	Voltage & Frequency
03	Input B(Input L2)	Voltage & Frequency
04	Input C(Input L3)	Voltage & Frequency
05	Bat. +	Voltage & Current
06	Bat. -	Voltage & Current
07	Backup time	Minutes&Capacity
08	Output A(Output L1)	Voltage&Frequency
09	Output B(Output L2)	Voltage&Frequency
10	Output C(Output L3)	Voltage&Frequency
11	Load A	Load
12	Load B	Load
13	Load C	Load
14	Total Load	Load
15	Temperature	Internal temperature and ambient temperature
16	Software version & model	Version of rectifier software, version of inverter software, model
17	CODE	Alarm Code(Warming Message)

1) When the UPS is connecting with the Utility or Battery at cold start mode, it shows as drawing below:

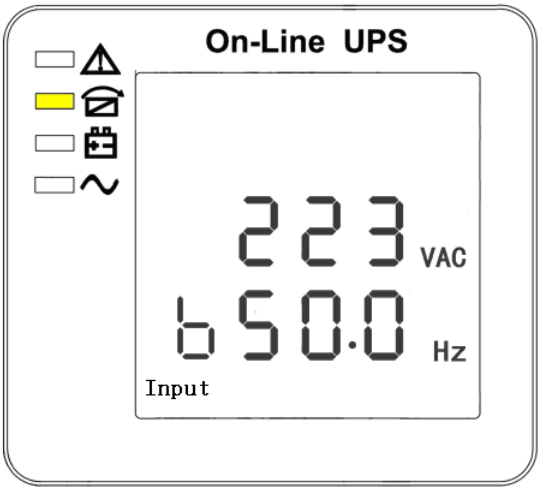


Operational Status and mode(When the UPS at single mode, it shows “NOA” or “ECO”, but If the UPS at parallel mode, it shows “PAL” instead.)

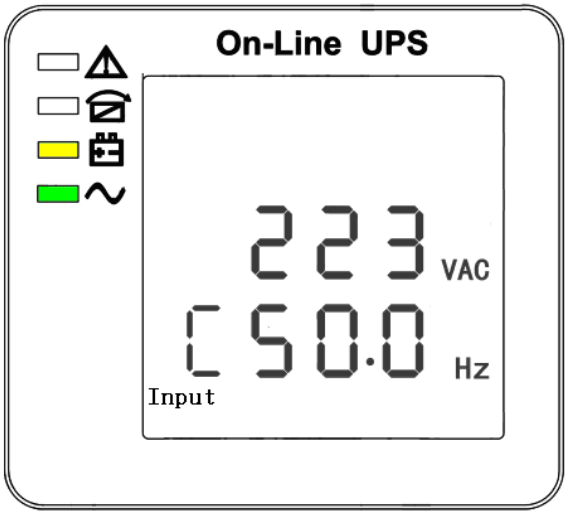
2) Press “scroll” button, the UPS goes to next page as shown below.



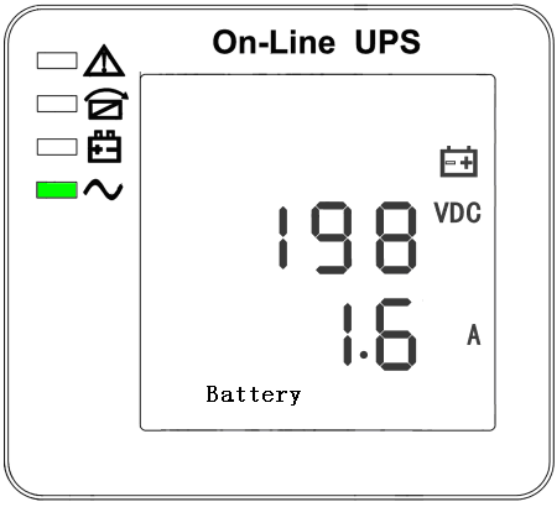
2.Phase A(L1) Input/Frequency



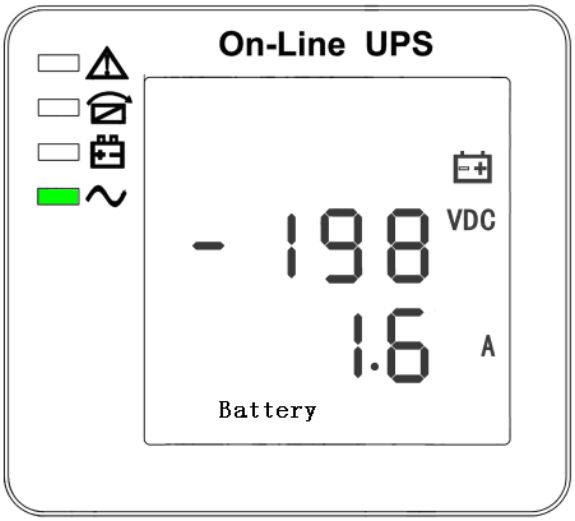
3. Phase B(L2) Input/Frequency



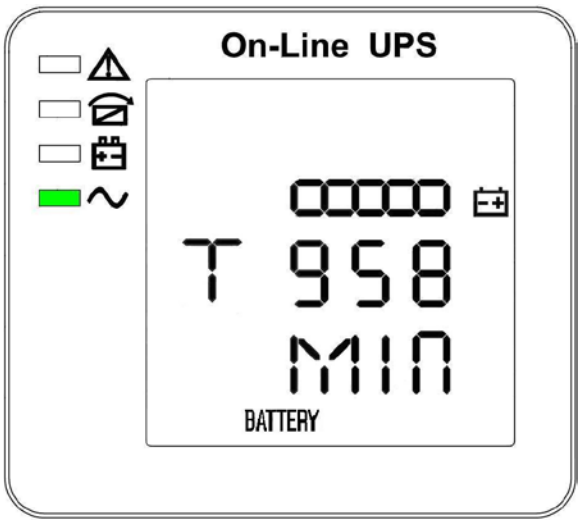
4. Phase C(L3) Input/Frequenc



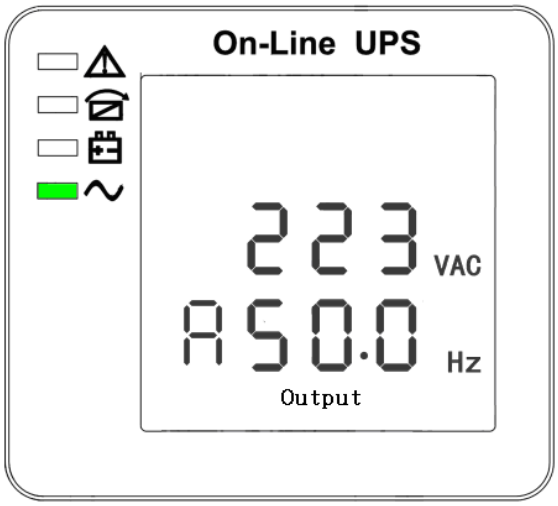
5. Bat +(Positive)



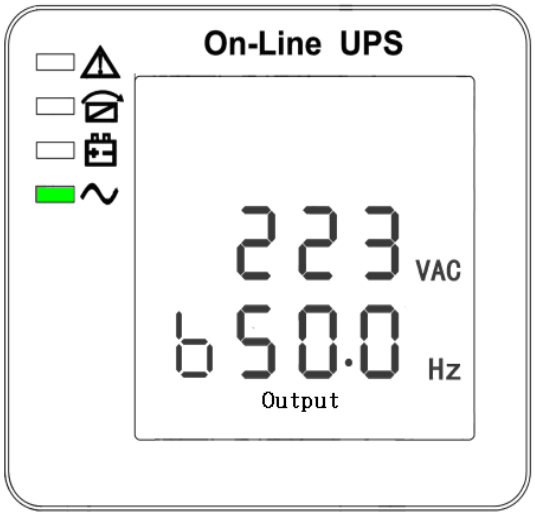
6. Bat –(Negative)



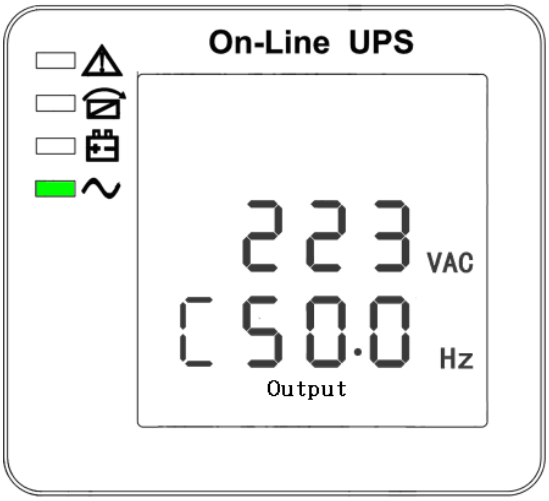
7. Backup time



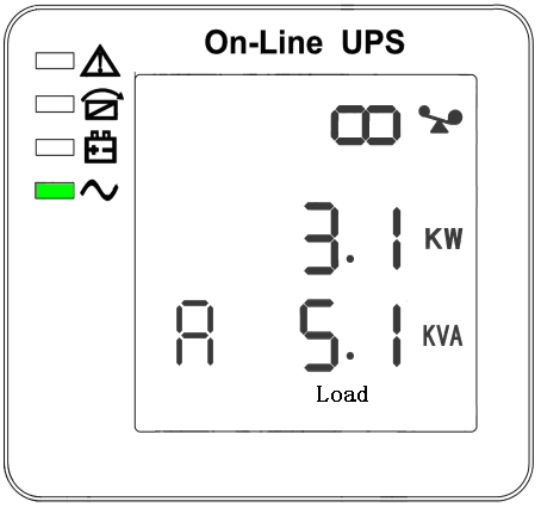
8. Phase A(L1) Output Voltage/Frequency



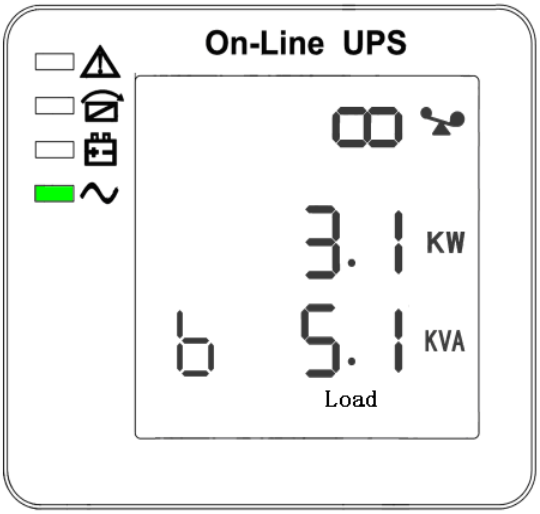
9. Phase B(L2) Output Voltage/Frequency



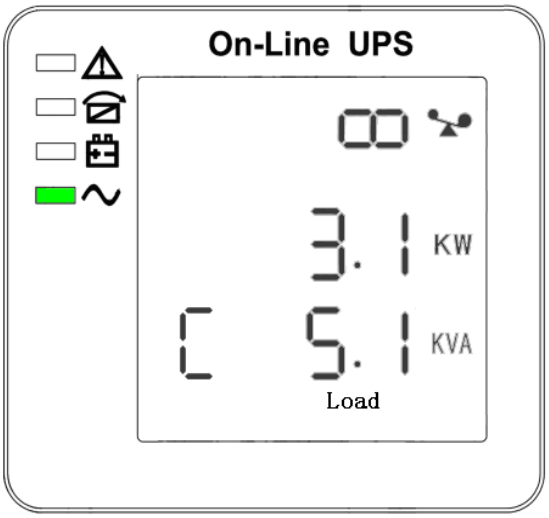
10.Phase C(L3) Output Voltage/Frequency



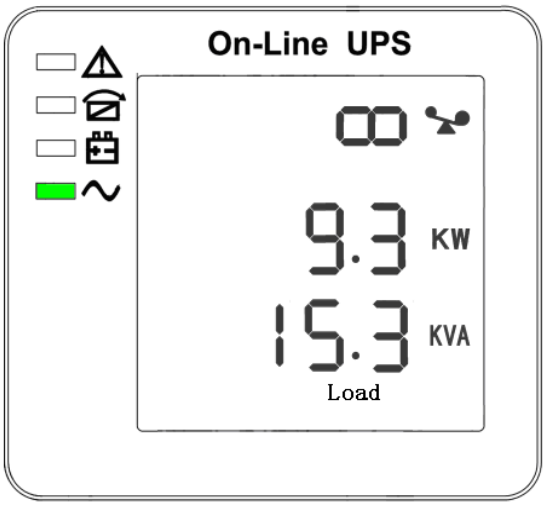
11. Phase A(L1) Load Capacity

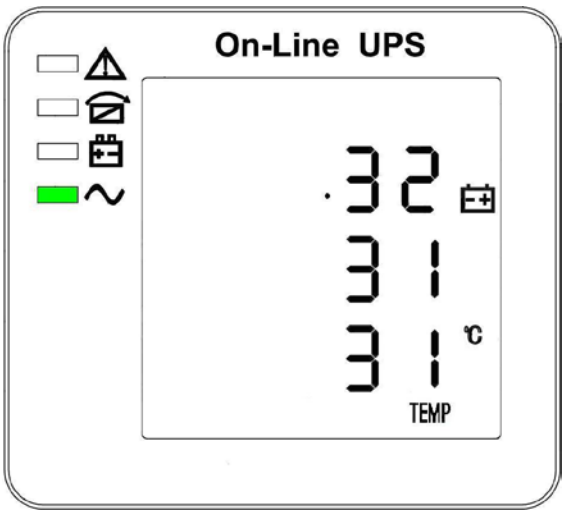


12. Phase B(L2) Load Capacity

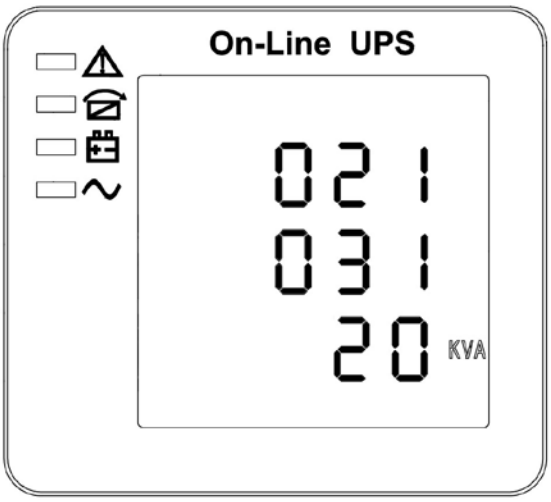


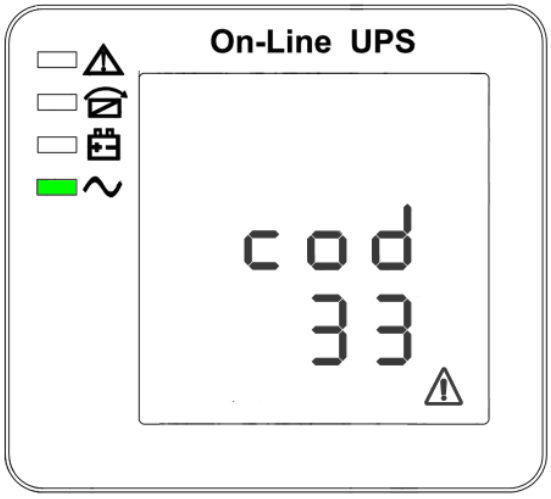
13. Phase C(L3) Load Capacity





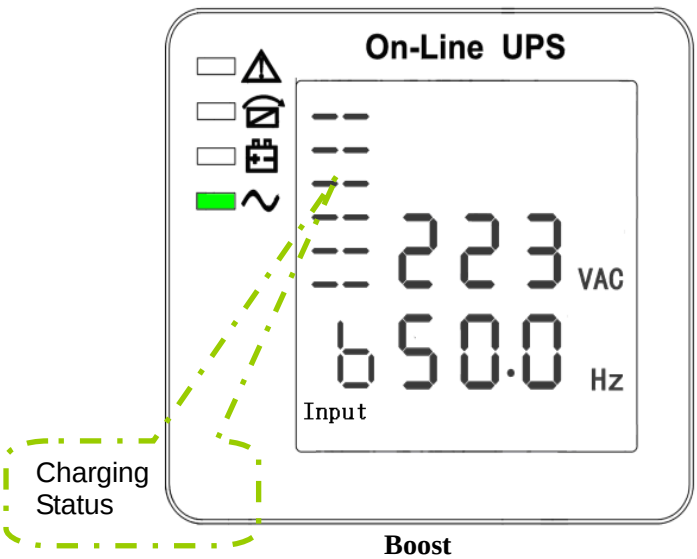
14.Total Load Capacity 15. Temperature(battery/Internal and ambient temperature)



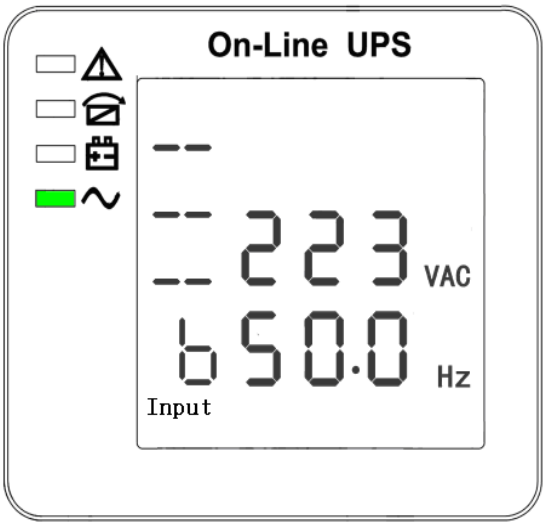


16. Software version & model 17.Alarm Code

If has battery charging, above 2-13 interface windows will also display the charging status at the same time as below:



Boost



Floating

3) Pressing “scroll” button, you may circulate all messages from the first one to the last one then returns back to the first one and vice versa.

4) All alarm codes are present when abnormal behavior(s) occur(s).

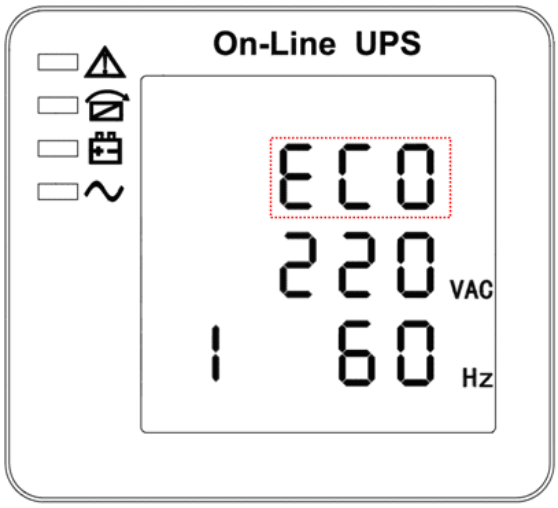
4.4 Parameters setting

The setting fuction is controled by 3 buttons (Enter ↻,Off ▲, On ▼): Enter ↻---goes into the setting page and value adjustment; Off ▲ & On ▼---for choosing different pages.

After the UPS turn ON, press buttons ↻ & ▲ for 2seconds and then goes into the setting interface page.

Note: Figure at left corner is the page number of the setting pages.

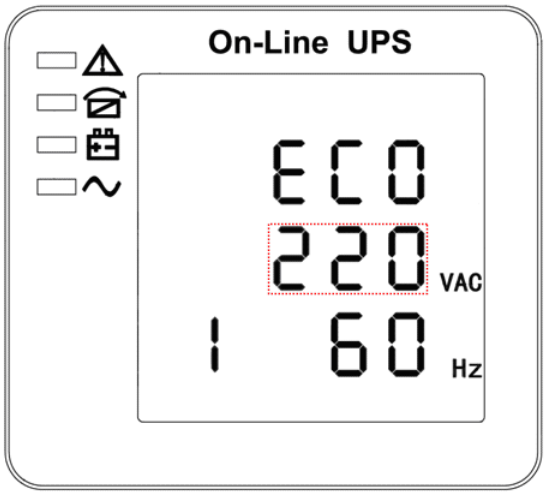
4.4.1 Mode setting



Mode setting (Note: Inside the broken-line is the flashing part.)

After entering the setting menu, it's mode setting defaulted, and the mode setting line flashing as in above picture. ①use button to choose different mode. There are 3 different modes for setting: ECO, PAL, NOR. ②press▲ to output voltage setting or parallel redundancy quantity setting.

4.4.2 Output voltage setting



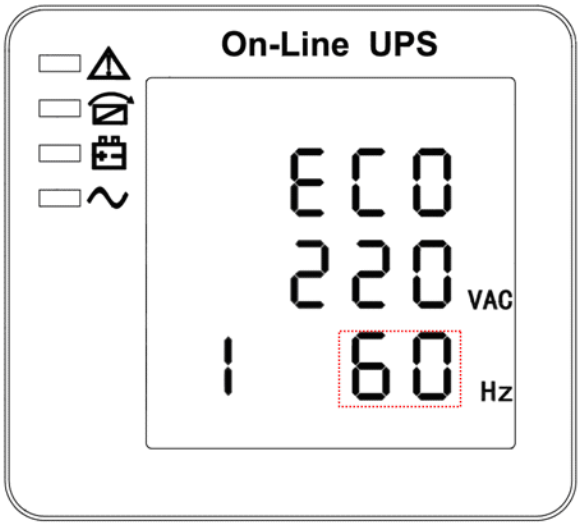
Output voltage setting (Note: Inside the broken-line is the flashing part.)

When under the mode setting press On▼ or when under frequency setting press Off▲, it goes to the output voltage setting. The output voltage line flashes as in above picture. ①use bu
Enter↻ to choose the different output voltage. There are 3 different voltages---220, 230, 240. ②press▲ or ▼ to exit the output voltage setting (save the output voltage setting) and goes to mode setting or frequency setting.

CAUTION!

Shutdown the inverter first if you want to set the output voltage and frequency when the UPS worked on inverter

4.4.3 Frequency setting



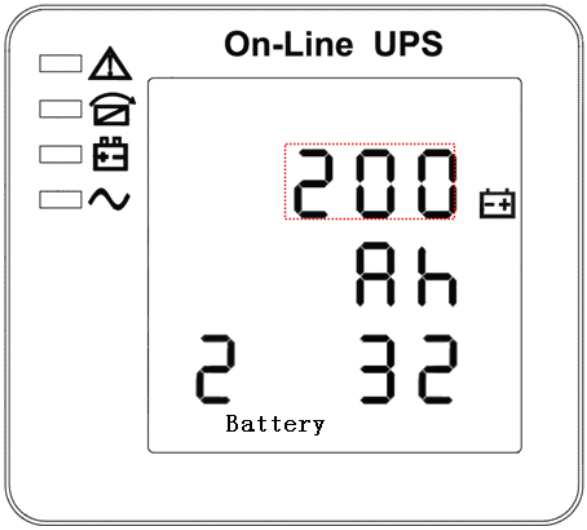
Frequency setting (Note: Inside the broken-line is the flashing part.)

When under the output voltage setting press On▼ or when under battery capacity setting press Off ▲, it goe
Enter↻ to choose the different frequency. There are 2 different frequency---50,60HZ. ②press▲ to exit the frequency setting (save the frequency setting) and goes to output voltage setting or battery capacity setting.

CAUTION!

Shutdown the inverter first if you want to set the output voltage and frequency when the UPS worked on inverter

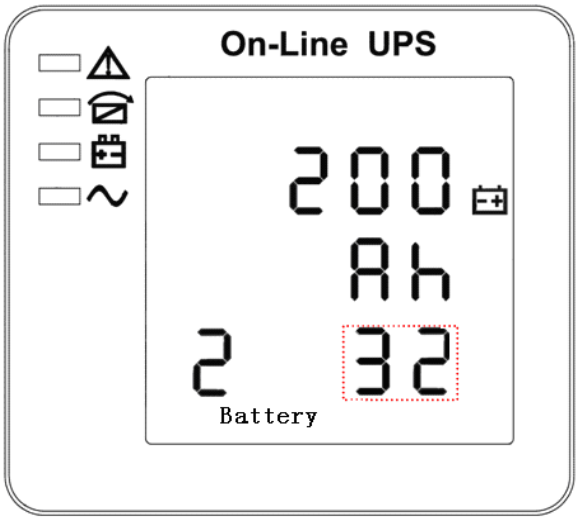
4.4.4 Battery capacity setting



Battery capacity setting (Note: Inside the broken-line is the flashing part.)

When under the frequency setting press On▼ or when under battery quantity setting press Off▲, it goes to the battery capacity setting. The battery capacity line flashes as in above picture. ①use button Enter↻ to choose the different battery capacity. Battery capacity range is 1-200Ah. (Note: long-press of Enter↻ can adjustment battery capacity quickly.) ②press▲ battery capacity setting (save the capacity setting) and goes to frequency setting or battery quantity setting.

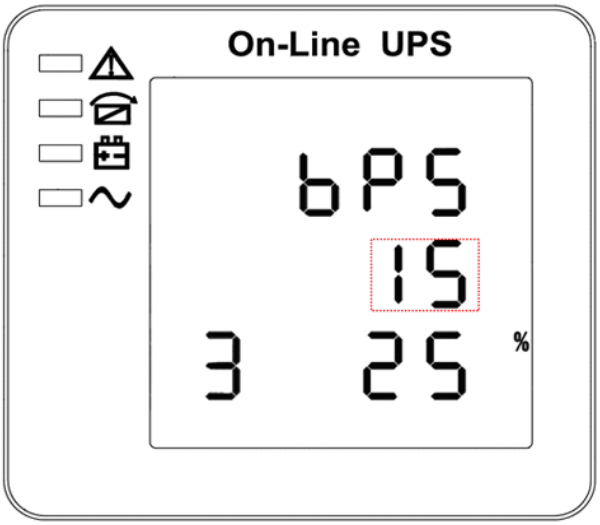
4.4.5 Battery quantity setting



Battery quantity setting (Note: Inside the broken-line is the flashing part.)

When under the battery capacity setting press On▼ or when under bypass voltage upper limit setting press Off▲, it goes to the battery quantity setting. The battery quantity line flashes as in above picture. ①use button Enter↻ to choose the different battery quantity. Battery quantity range is 32,34,36,38,40. ②press▲ and goes to battery capacity setting or bypass voltage upper limit setting.

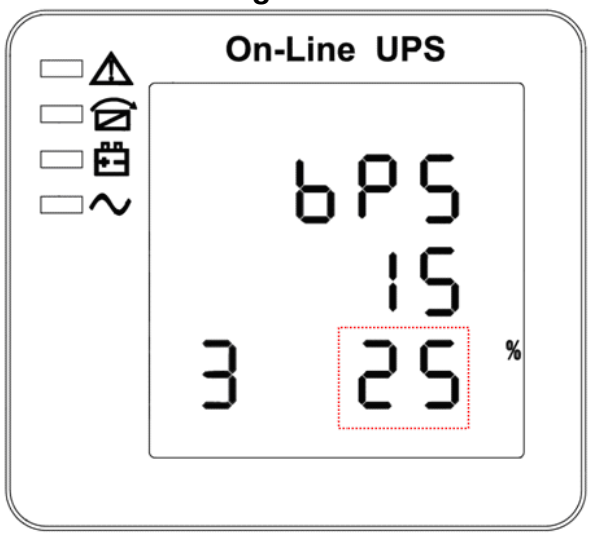
4.4.6 Bypass voltage upper limit setting



Bypass voltage upper limit setting (Note: Inside the broken-line is the flashing part.)

When under the battery quantity setting press On▼ or when under bypass voltage lower setting press Off▲, it goes to the bypass upper limit setting. The bypass upper limit line flashes as in above picture. ①use set the Enter↻ to set the different bypass voltage upper limit. The bypass voltage upper limit range is 5%,10%,15%,25%(25% only for 220V output). ②press▲ bypass voltage upper limit setting (save the bypass voltage upper limit setting) and goes to battery quantity setting or bypass voltage lower limit setting.

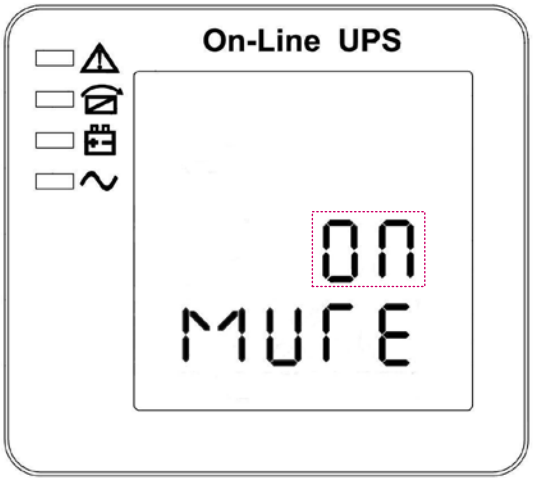
4.4.7 Bypass voltage lower limit setting



Bypass voltage lower limit setting (Note: Inside the broken-line is the flashing part.)

When under the bypass voltage upper limit setting press On▼ or when under parallel ID setting press Off▲, it goes to the bypass lower limit setting. The bypass lower limit line flashes as in above picture. (“-” for negative, positive does not have any symbol.) ①use Enter↻ to set the different bypass voltage lower limit. The bypass voltage lower limit range is 20%,30%,45%. ②press▲ exit the bypass voltage lower limit setting (save the bypass voltage lower limit setting) and goes to bypass upper limit setting or parallel ID setting.

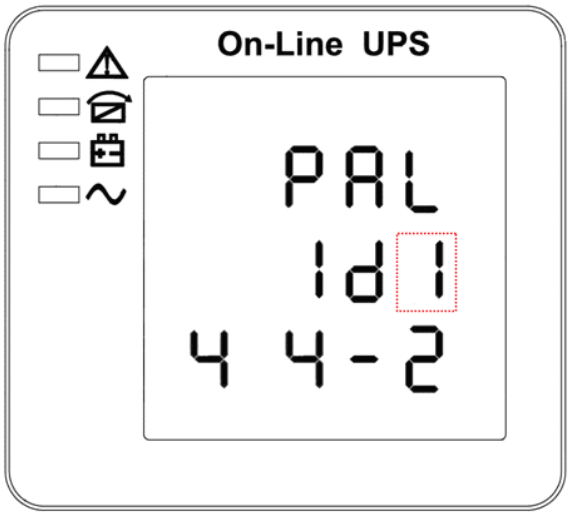
4.4.8 Buzzer Mute Setting



Buzzer Settings (note: red dashed box is the scintillation part

Press key ON under bypass volt-lo setting or press key OFF into buzzer setting under Parallel operation ID setting. The scintillation of setting state shows as Figure 14 (Note: ON shows MUTE, OFF shows NO MUTE). ①press button Cycle Settings, mute choice has On and Off. ②press button ON volt-lo setting or parallel operation ID Settings.

4.4.9 Parallel ID setting



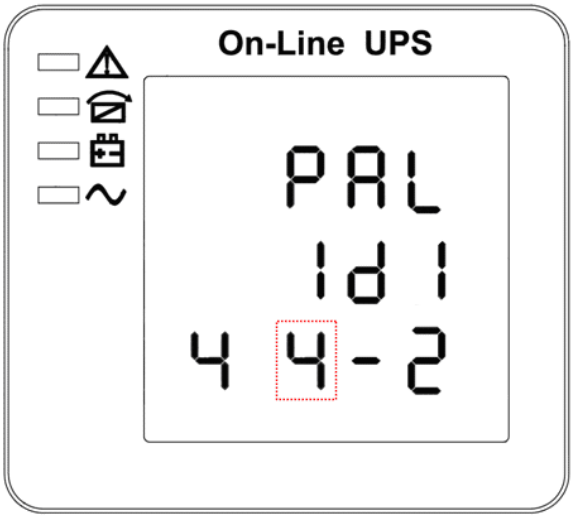
Parallel ID setting (Note: Inside the broken-line is the flashing part.)

When under the bypass voltage lower limit setting press On▼ or when under parallel quantity setting press Off ▲, it goe button Enter↻ to set the different parallel ID. The parallel ID range is 1~4. ②press▲ parallel ID setting (save the parallel ID setting) and goes to bypass lower limit setting or parallel quantity setting.

CAUTION!

Parallel cable cannot be connected when setting the parallel parameters.

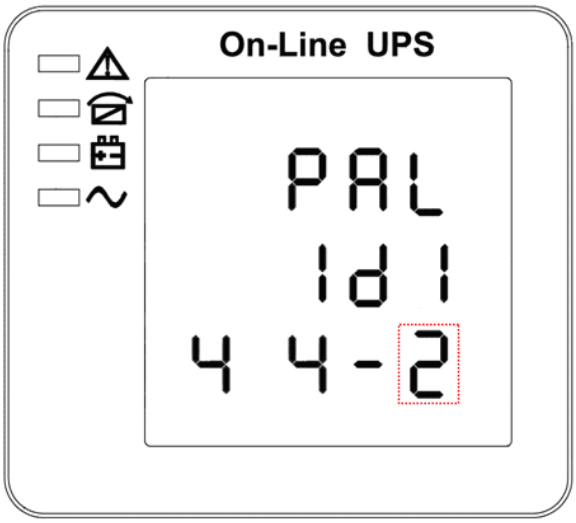
4.4.10 Parallel quantity setting



Parallel quantity setting (Note: Inside the broken-line is the flashing part.)

When under the parallel ID setting press On▼ or when under parallel redundancy quantity setting press Off▲, it goes to the parallel quantity setting. The parallel quantity flashes as in above picture. ①use button Enter↻ to set the parallel quantity. The parallel quantity range is 2~4. ②press▲ or ▼ to exit the parallel quantity setting (save the parallel quantity setting) and goes to parallel ID setting or parallel redundancy quantity setting.

4.4.11 Parallel redundancy quantity setting



Parallel redundancy quantity setting (Note: Inside the broken-line is the flashing part.)

When under the parallel quantity setting press On▼, it goes to the parallel redundancy quantity setting. The parallel redundancy quantity flashes as in above picture. ①use button Enter↻ to set the parallel redundancy quantity. The parallel redundancy quantity range is 0~3. ②press▲ to go to parallel quantity setting, or ▼ to exit the mode setting. Then UPS LCD panel setting is accomplished.

4.5 Display Messages/Troubleshooting

This section lists the event and alarm messages that the UPS might display. The messages are listed in alphabetical order. This section is listed with each alarm message to help you troubleshoot problems .

Display messages

Operational Status and Mode(s)

item	Content Displayed	LED			
		Fault	Bypass	Battery	Inverter
1	Initialized	**EXTINGUISH**	**EXTINGUISH**	**EXTINGUISH**	**EXTINGUISH**
2	Standby Mode	**EXTINGUISH**	**EXTINGUISH**	X	**EXTINGUISH**
3	No Output	**EXTINGUISH**	**EXTINGUISH**	X	**EXTINGUISH**
4	Bypass Mode	**EXTINGUISH**	**LIGHT**	X	**EXTINGUISH**
5	Utility Mode	**EXTINGUISH**	**EXTINGUISH**	X	**LIGHT**
6	Battery Mode	**EXTINGUISH**	**EXTINGUISH**	**LIGHT**	**EXTINGUISH**
7	Battery Self-diagnostics	**EXTINGUISH**	**EXTINGUISH**	**LIGHT**	**EXTINGUISH**
8	Inverter is starting up	**EXTINGUISH**	X	X	**EXTINGUISH**
9	ECO Mode	**EXTINGUISH**	X	X	X
10	EPO Mode	**LIGHT**	**EXTINGUISH**	X	**EXTINGUISH**
11	Maintenance Bypass Mode	**EXTINGUISH**	**EXTINGUISH**	**EXTINGUISH**	**EXTINGUISH**
12	Fault Mode	**LIGHT**	X	X	X

CAUTION："X" means it is determined by other conditions

Alarm Information

Event log	UPS Alarm Warning	Buzzer	LED
1	Rectifier Fault	Beep continuously	Fault LED lit
2	Inverter fault(Including Inverter bridge is shorted)	Beep continuously	Fault LED lit
3	Inverter Thyristor short	Beep continuously	Fault LED lit
4	Inverter Thyristor broken	Beep continuously	Fault LED lit
5	Bypass Thyristor short	Beep continuously	Fault LED lit
6	Bypass Thyristor broken	Beep continuously	Fault LED lit
7	Fuse broken	Beep continuously	Fault LED lit
8	Parallel relay fault	Beep continuously	Fault LED lit
9	Fan fault	Beep continuously	Fault LED lit
10	Reserve	Beep continuously	Fault LED lit
11	Auxiliary power fault	Beep continuously	Fault LED lit
12	Initializtion fault	Beep continuously	Fault LED lit
13	P-Battery Charger fault	Beep continuously	Fault LED lit
14	N-Battery Charger fault	Beep continuously	Fault LED lit

15	DC Bus over voltage	Beep continuously	Fault LED lit
16	DC Bus below voltage	Beep continuously	Fault LED lit
17	DC bus unbalance	Beep continuously	Fault LED lit
18	Soft start failed	Beep continuously	Fault LED lit
19	Rectifier Over Temperature	Twice per second	Fault LED lit
20	Inverter Over temperature	Twice per second	Fault LED lit
21	Reserve	Twice per second	Fault LED lit
22	Battery reverse	Twice per second	Fault LED lit
23	Cable connection error	Twice per second	Fault LED lit
24	CAN comm. Fault	Twice per second	Fault LED lit
25	Parallel load sharing fault	Twice per second	Fault LED lit
26	Battery over voltage	Once per second	Fault LED blinking
27	Mains Site Wiring Fault	Once per second	Fault LED blinking
28	Bypass Site Wiring Fault	Once per second	Fault LED blinking
29	Output Short-circuit	Once per second	Fault LED blinking
30	Rectifier over current	Once per second	Fault LED blinking
31	Bypass over current	Once per second	BPS LED blinking
32	Overload	Once per second	INV or BPS LED blinking
33	No battery	Once per second	Battery LED blinking
34	Battery under voltage	Once per second	Battery LED blinking
35	Battery low pre-warning	Once per second	Battery LED blinking
36	Internal Communication Error	Once per 2 seconds	Fault LED blinking
37	DC component over limit.	Once per 2 seconds	INV LED blinking
38	Parallel Overload	Once per 2 seconds	INV LED blinking
39	Mains volt. Abnormal	Once per 2 seconds	Battery LED lit
40	Mains freq. abnormal	Once per 2 seconds	Battery LED lit
41	Bypass Not Available		BPS LED blinking
42	Bypass unable to trace		BPS LED blinking
43	Inverter on invalid		
44	Module screw unlock		

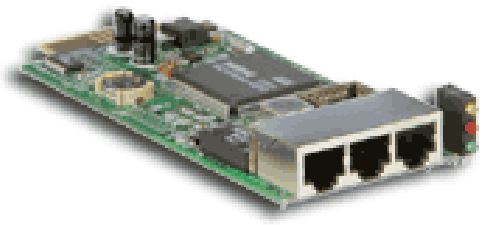
4.6 Options

SNMP card: internal SNMP / external SNMP optional

◆ Loosen the 2 torque screws (on each side of the card).

◆ Carefully pull out the card. Reverse the procedure for re-installation

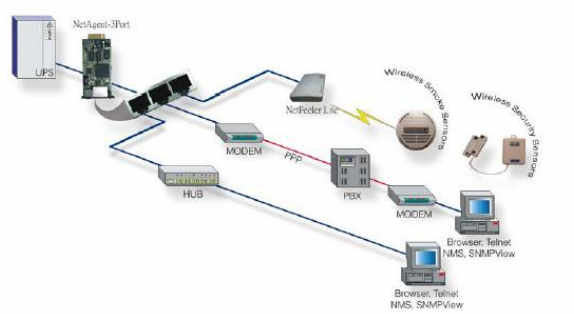
The slot called SNMP supports the MEGAtec protocol. We advise that NetAgent II-3 port is also a tool to remotely monitor and manage any UPS system



the overview of the SNMP card

NetAgent II-3Ports supports the Modem Dial-in(PPP) function to enable the remote control via the internet when the network is unavailable .

In addition to the features of a standard NetAgent Mini, NetAgent II has the option to add NetFeeler Lite to detect temperature, humidity, smoke and security sensors. Thus, making NetAgent II a versatile management tool. NetAgent II also supports multiple languages and is setup for web-based auto language detection .



Typical topology of the UPS Network Management

Appendix 1 Specifications

Model			10KVA S/H	15KVA S/H	20KVA S/H	30KVA S/H	40KVA H	60KVA H	80KVA H
Capacity			10KVA 8KW	15KVA 12KW	20KVA 16KW	30KVA 24KW	40KVA 32KW	60KVA 48KW	80KVA 64KW
Input	Phase		3 Phase 4 Wires and Ground						
	Rated Voltage		380/400/415Vac						
	Voltage Range		208~478Vac						
	Frequency Range		40Hz-70Hz						
	Power Factor		≥0.99						
	Current THDi		≤3%(100% nonlinear load)						
	Bypass Voltage Range		Max.voltage: +15%(optional +5%、+10%、+25%) Min. voltage: -45% (optional -20%、-30%) Frequency protection range: ±10%						
	Generator Input		Support						
Output	Phase		3 Phase 4 Wires and Ground						
	Rated Voltage		380/400/415Vac						
	Power Factor		0.8						
	Voltage Regulation		±2%						
	Frequency	Utility Mode	±1%、±2%、±4%、±5%、±10% of the rated frequency(optional)						
		Battery Mode	(50/60±0.2%)Hz						
	Crest Factor		3:1						
	THD		≤2% with linear load ≤5% with non linear load						
	Waveform		Pure Sinewave						
Efficiency			≥92% at normal mode						
Battery	Voltage		Standard unit: ±216V DC; Long time unit Optional Voltage: ±192V\±204V\±216V\±228V\±240V DC						
	Capacity(standard unit)		12V/38AH						
	Charge Current(A)		5.7A(Standard unit) ； Long time unit Maximum current 6A(charge current can be set		Maximum current 12A (charge current can be set according to battery capacity installed)		Maximum current 18A (charge current can be set according to battery capacity installed)		

		according to battery capacity installed)							
Transfer Time			Utility to Battery : 0ms; Utility to bypass: 0ms						
Protection	Overload	AC Mode	Load≤110%: last 60min，≤125%: last 10min，≤150%: last 1min，≥150% shut down UPS immediately。						
		Bat. Mode	Load≤110%: last 10min，≤125%: last 1min，≤150%: last 5S，≥150% shut down UPS immediately。						
		Bypass Mode	Breaker 20A	Breaker 32A	Breaker 40A	Breaker 50A	Breaker 80A	Breaker 100A	Breaker 125A
	Short Circuit		Hold Whole System						
	Overheat		Line Mode: Switch to Bypass; Backup Mode: Shut down UPS immediately						
	Battery Low		Alarm and Switch off						
	Self-diagnostics		Upon Power On and Software Control						
	EPO(optional)		Shut down UPS immediately						
	Battery		Advanced Battery Management						
	Noise Suppression		Complies with EN62040-2						
Alarms	Audible & Visual		Line Failure, Battery Low, Overload, System Fault						
Display	Status LED & LCD		Line Mode, Bypass Mode, Battery Low, Battery Bad, Overload & UPS Fault						
	Reading On the LCD		Input Voltage, Input Frequency, Output Voltage, Output Frequency, Load Percentage, Battery Voltage & Inner Temperature						
Comunication Interface			RS232，RS485，Dry Contact，Parallel，SNMPcard（optional）						
Environment	Operating Temperature		0 ℃40 ℃						
	Storage Temperature		-25 ℃55 ℃						
	Humidity		0～95% non condensing						
	Altitude		< 1500m						
Other	Unit Dimensions(W*D*H)		600*780*1200						
	Weight (Kg)		10KVAS:622 10KVAH:123	15KVAS:625 15KVAH:126	20KVAS:626 20KVAH:127	30KVAS:626 30KVAH:127	158	158	195

Appendix 2 Problems and Solution

In case the UPS can not work normally, it might be wrong in installation, wiring or operation. Please check these aspects first. If all these aspects are checked without any problem, please consult with local agent right away and provide below informations.

（1） Product model name and serial number.

（2） Try to describe the fault with more details, such as LCD display info, LED lights status, etc.

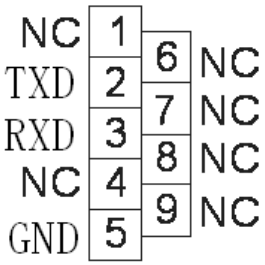
Read the user manual carefully, it can help a lot for using this UPS in the right way. Some FAQ (frequently asked questions) may help you to troubleshoot your problem easily.

No.	Problem	Possible reason	Solution
1	Utility is connected but the UPS can not be powered ON.	Input power supply is not connected; Input voltage low; The input swith of the module is not switched on .	measure if the UPS input voltage/frequency are within the window. Check if all modules input are switched on
2	Utility normal but Utiltiy LED does not light on, and the UPS operates at battery mode	The input breakers of the Modules are not switched on; input cable is not well connected	Switch on the input breaker; Make sure the input cable is well connected.
3	The UPS does not indicate any failure, but output do not have voltage	Output cable does not well connected	Make sure the output cable is well connected.
4	The UPS module can not transfer to bypass or inverter	Module does not well inserted; The left coronal screw is not tight. Output breaker do not switch on	Pull out the module and insert again; Tighten the screw; Switch on the output breaker.
5	The UPS module fault LED remains ON	The module is already damaged	Take out this module, replace with a new module.
6	Utility LED is flashing	Utility voltage exceeds UPS input range.	If the UPS operates at battery mode, please pay attention to the remaining backup time needed for your system.
7	Battery LED is flashing but no charge voltage and current	Battery breaker does not switch on, or batteries are damaged, or battery is reversely connected. battery number and capacity are not set correctly.	Switch on the battery breaker. If batteries are damaged, need to replace whole group batteries, Connect the battery cables correctly; Go to LCD setting of the battery number and capacity, set the correct data.
8	Buzzer beeps every 0.5 seconds and LCD display “output	Overload	remove some load

	overload”		
9	Buzzer long beeps, LCD display “output short circuit”	The UPS output is in short circuit	Make sure the load is not in short circuit, then restart the UPS.
10	The LED of the Module with RED light	The module is not inserted properly.	Pull out the module and insert properly.
11	The UPS only works on bypass mode	The UPS is set to ECO mode, or the transfer times to bypass mode are limited.	Set the UPS working mode to Single Module type(non-parallel) or to reset the times of transferring to bypass or re-start the UPS
12	Can not Black start	Battery switch is not properly closed； Battery fuse is not open； Or Battery low	Close the battery switch； Change the fuse； Recharge the battery
13	Buzzer beeps continuously and LCD indicates Rectifer fault or output fault	UPS is out of order	Consult with your local agent for repair

Appendix 3 RS232 communication port definition

Definition of Male port：



Connection between PC RS232 port and UPS RS232 port

PC RS232 port	UPS RS232 port	
Pin 2	Pin 2	UPS send，PC receive
Pin 3	Pin 3	PC send，UPS receive
Pin 5	Pin 5	ground

Available function of RS232

- ◆ Monitor UPS power status。
- ◆ Monitor UPS alarm info。
- ◆ Monitor UPS running parameters。
- ◆ Timing off/on setting。

RS-232 communication data format

Baud rate ---------- 9600bps

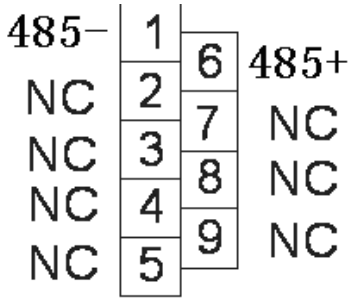
Byte length ---------- 8bit

End bit ---------- 1bit

Parity check ---------non

Appendix 4 RS485 communication port definition

Definition of Male port：



Connection between the computer's RS485 port and UPS RS485 port.

PC（DB9 Male)	UPS（DB9 female）	Description
Pin 1	Pin 1	485 "-"
Pin 6	Pin 6	485 "+"

Available function of RS485

- ◆ Monitor UPS power status。
- ◆ Monitor UPS alarm info。
- ◆ Monitor UPS running parameters。
- ◆ Timing off/on setting。

CAUTION！

RS232 & RS485 ports cannot be used at the same time.

Appendix 5 Drycontact communication port definition

The external interface of Dry Contact only has DB9 female head interface. See the below DB9 female head interface definition diagram

Pin-out	Functional Description	I/O
1	UPS Failure	Output
2	Summary Alarm	Output
3	GND	
4	Remote Shutdown	Input
5	Common	
6	Bypass	Output
7	Battery Low	Output
8	UPS ON	Output
9	Utility Failure	Output

Each LED display image after test fixtures access circuit

Alarm Sistuation	LED display sistuation of station					
	Fault LED	Bypass LED	Alarm LED	Battery Low LED	UPS ON LED	Mains Interrup LED
Initial State	LIGHT	EXTINGUISH	LIGHT	LIGHT	LIGHT	LIGHT
Utility Interrup	LIGHT	EXTINGUISH	EXTINGUISH	LIGHT	LIGHT	EXTINGUISH
Bypass	LIGHT	LIGHT	EXTINGUISH	LIGHT	EXTINGUISH	LIGHT
Battery Low	LIGHT	EXTINGUISH	LIGHT	EXTINGUISH	LIGHT	LIGHT
Fault	EXTINGUISH	EXTINGUISH	EXTINGUISH	LIGHT	LIGHT	LIGHT
Shutdown Activation	All LED unchanged					

If LED display is different form the above table, please recheck test fixtures and Dry Contact